

Vasyl Prydatko¹**BIODIVERSITY AND BIORESOURCES IN UKRAINE:
REVIEW OF SOE-PUBLICATIONS² (1992-1998), TRENDS AND TENDENCIES RE-
ESTIMATION (1966-1999)**

[Translated from Ukrainian by Ann Starkova and Olena Prokopchuk, ULRMC]

A critical review of SoE-publications in Ukraine (1992-1999) has not been carried out yet, which is a deviation from traditions of the Ukrainian school of Theoretical Biology.

The article is the first attempt to implement such internal scientific audit – a necessary condition for improvement of means and approaches to assessment of Ukrainian biodiversity and bioresources state, and ensuring the effective forecasting.

The article argues that despite a nine-year experience of preparation of annual specialized reviews on concerned topics, these reviews have a slight module peculiarities and insufficient volume for the proper descriptiveness. In other words, they are still slightly compatible with reviews of the high international level, or with a full package of requirements of the Convention on Conservation of Biodiversity (CBD), and its scientific forums. Intending a practical use, the mentioned material is presented in the form of proposals for a typical report on the state of environment in Ukraine, which can be used in 2000. It demonstrates some informational misunderstandings of past years on a basis of selected examples (rare and threatened animals and plants, hunting animals, birds, mammals), as well as some effects of unpunctual or rash citations.

The author assumes that increase of “a compilation crisis” concerning biodiversity and biological resources reporting takes place in Ukraine. He also argues that currently a biological component of SoE-publication in Ukraine is losing its scientific and factual attractiveness. Its character is more medley than well-ordered according to priorities or even according to key words. The author also persuades that as a result of this hyper-compilation, intangibility of many data types from Ukraine is evident in the international information sharing system, which theoretically reduces a probability of auto-inclusions of certain priorities and urgent problems in Ukraine into perspective lists of projects and programs: when foreign managers independently realize their mediatory potentials for Ukraine.

The author comes out with a suggestion that a long-term informational confusion would have a chance to initiate an undesirable effect when biodiversity and biological resources management would have an inertial, rather guessing character than a scientifically measured one, and it would gain virtual features.

These materials could be useful for authors of new annual reports on biodiversity and biological resources state in Ukraine.

INTRODUCTION

Attentive studying foreign SoE sources, issued by foreign press materials, and Internet-data prove the fact that Ukraine owns much bigger informational and scientific potential on the state of biodiversity and biological resources than that outlined by them, and information on this issue could be presented in a much more interesting way and in better choice of words than it is incorporated in reality. It seems that during recent three years managers have lost data on where

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² SoE – State of Environment. In the international communicative practice these are reporting materials or target publications on the state of environment and its components. Up to date [SoE] is widely used for search work in the Internet. Other acronym like [SoE-(year)] means reference to certain report of Ukraine.

to and in which format the required information is submitted, what key problems or even words are used in modern search systems like *YAHOO!* or *ALTA – VISTA*, etc. We can not feel that the main principles of descriptive natural sciences are to involve the most amount of comparison and scientific data (and not the least), to use services of the most quantity of observers in the process of work (and not the least quantity!); it means to play according to certain statistical rules, and then information on complex natural phenomena will become statistically visible. The main thing is that in any case we can now analyze the status of things in Europe more and more actively, using data from Ukraine, and not vice versa: we do have so demonstrable natural resources! It is also should be reminded that until now Ukraine has already achieved evident victories at the international biological level: a representative from Ukraine held a chair at sessions of the 2nd Meeting of the Conference of Parties to the Convention on Biodiversity Conservation in Jakarta in 1995. It is not well known that in 1997 Ukraine factually assisted the Secretariat of Convention on Biodiversity Conservation in organizing appropriate work on implementation of the Article 6 to the Convention. (At that time, as it was recognized by Juma C., the General Secretary of the Convention, Ukraine's report on biodiversity conservation became the first one and was used for a certain period of time as a kind of manual.) A conceptual approach of Ukraine to biodiversity conservation in agriculture during the 4th Meeting of the Conference of Parties to the Convention was disseminated through the special newspaper "Biodiversity" published for the Meeting. In 1997, Ukraine was proposed (together with Brazil, Marshall islands, Philippines, Kenya and others) to develop approaches to biodiversity indicators in agriculture.

In order not to lose these or other findings now, it is necessary, first of all, to overcome an increasing compilation crisis. For example, it has become almost a tradition to list everything referred to flora and fauna of Ukraine in each new collection - to list threatened taxons, 22 wetlands of international importance, to provide a compiled sketch "Natural conditions of Ukraine" – what for? Where is the glorious Ukrainian ecology school, teamwork, thorough literature reviews, statistical processing, comparative analysis, and respectful citation of colleagues' data?

Perhaps, just as a result of neglecting usual research traditions, even such target document as "Main State Policy Directions for Ukraine in the Environment Domain" (1998) does not look convincing in respect to its biological component. A simple statistical research with the help of *WinWord* search options shows that among 18,390 words of this vast document a percentage of words related to animals is likely 0.11%, those related to ecosystems – 0.12%, plants – 0.21%, forests – 0.34%, the same for words similar to "industry" – 0.57%, "resources" – 0.89%, and "technologies" – 0.70%. So, in general, for the first group of words this likelihood is less than 0.5%.

The conclusion can be easily made that from the point of view of social ecology, the referenced document deals more with analysis of "nature-2" type, rather than "nature 1"³.

Taking into account the above mentioned, the author attempted (using examples of a number of Ukrainian SoE-publications and comparisons) to show their most common negatives in respect to providing information on biodiversity and biological resources, and made another

³ Note: Park and Bridges, representatives of Chicago school of Socioecology, introduced social ecology definition. Initially, these authors meant the theory of studies of social mechanisms for creation and functioning of cities. Modern understanding of this definition became much broader: this is a kind of science on artificial natural environment of the humankind and forms of interaction with it. In other words, Socioecology studies a structure and peculiarities of operation of "nature-2" type special objects. A city, water reservoir, nuclear plant, heat power station, forest park, etc. can be considered as objects of that type, i.e. an infrastructure landscape unit explored by the human beings, and furthermore, in greater scale, a geospheric unit. Please, pay your attention to the fact that animals and plants do not have, conventionally speaking, "nature-2". Only the human was so witty to create this "nature-2".

try to recur to the issue of priorities that are in popular demand in the world of informatics. The author tried to consider requirements of countries - participants of the Convention on Biodiversity and its scientific forums. From the practical point of view, remarks are made on the structure and desirable contents of the section covering biological resources in a typical report on the state of environment, which can be used already in the year of 2000. In this way, it is demonstrated now how under-saturated domestic SoE-sources can be, including official ones, in respect to facts from real life, scientific and public press, and publications of NGOs⁴.

In other words, newspapers and scientific articles do not always address mutual topics. One simple fact proves the existence of that new problem: even in the street media it is possible to find data on plants and animals that are appropriate for statistical processing and not available in specialized SoEs. (See below.) Furthermore, you can also find an evidence of the fact that the interference of mass media already makes it possible to avoid local ecological disasters. ("Fakty", 19.01.2000, p. 8). These all are features of compilation crises in the domain of environmental information.

MAIN PART

What are we dealing with when speaking on biodiversity and biological resources? Why do we have to thoroughly prepare corresponding sections for SoE? For some unknown reason it is believed that biota of Ukraine is made up of more than 70,000 species. These are the data derived from the first and the last official attempt to formally evaluate the state of biodiversity in Ukraine (National Report of Ukraine... 1997). These data appeared to be included in the most official information inquiries for 1988-1999. If we speak about a figures order, it is an underestimated evaluation; especially, when we, first, take into consideration even the latest data on biota of Europe, where only for animals 201,070 taxons are stated (ECNC...,1999), and, second, taking account of the location of Ukraine on European biological maps, in particular, in Atlas Flora Europaeae/ The Natural History Museum (Biodiversity Measuring the Variety...1999). So, we are speaking about the range of approximately 70,000-100,000 taxons. For comparison purposes, figures up to 100,000 taxons are given for Croatia. (Bulletin..., 1999).

Referring to details, an irresistible compilation stipulates, first of all, the fact that essential differences in data keep on growing, secondly, new data are not taken into consideration timely. In the official SoE-sources you can find that in 1992, in the fauna of Ukraine there were simultaneously **113** (UN Conference... 1992) and **101** species of mammals (National Report...,1992). Meanwhile, further this interesting "trend" in national reports was as follows: 1993 - **111**, 1995 - **101**, 1996 – **data are not available**, 1997 – **108**. The latter figure has become a standard one and was included in almost all official publications, and only in 1999 it was updated during attentive studies of scientific materials on ecological network: **117** species of mammals (Zagorodniuk, 1999, p.72). At the same time, on page 25 of the same collection the authors of the section "Natural Conditions of Ukraine" are traditionally presenting an amount of **108** species.

Compilation crisis spoils even documents of a quite high level. For example, in the latest issue of special documents T-PVS(99)43 prepared for the Bern Convention (Nature Conservation in Ukraine...,1999, p.2) the contents of one of the known document tables - National Report of Ukraine on Conservation of Biological Diversity (1997) - was rather poorly presented. For example, reading it you may understand that in Ukraine there are **5100 species of vascular plants, fungi and mixomycetes**, instead of **5100 vascular plants**, and besides that, a

⁴ Non-governmental nature protection organizations.

little proportion of new statistical biological information that would be of interest for scientists is presented here.

For comparison, new material, not well-known in foreign information sources, would rather be presented here. This material gives essentially more precise data than that of the National Report of Ukraine on Conservation of Biological Diversity (1997). These data prove that for the south of Ukraine the disappearance of **1** species of vascular plants is stated, but the existence of two species is confirmed (Jena, 1998; Didukh, 1998); **1** new species of Far-Eastern flour fungi *Microsphaera syringae* is found that fully ousted the other type of fungi species – *Microsphaera jakzevsky* (Heliuta, 1997). These data also prove that **4** new for Ukraine one-day species types are detected (Ephemeroptera, Insecta), and together with them **1** new genus was also detected R.Godunko (1997); there are more than **1200** genera of Coelminths in Ukraine (Degtiar, 1997), but not 1600 (National Report of Ukraine on Conservation of Biological Diversity, 1997.p.8), there are **1840** types of animalcular (without Phytomastigins) that makes 3% of the world's fauna (Dovgal, 1997), or, perhaps, 1800 ones (National Report of Ukraine on Conservation of Biological Diversity, 1997, p.8), or some explanations should be given to such discrepancies in data.

It is possible that just because of that jumble and hyper-compilation the line concerning Ukraine remains to be not filled in ECNC meta database on the Internet (ECNC/BIODIVERSITY SERVER., 2000), in comparison to other countries (Table 1).

Table 1. Biodiversity in the countries of Europe according to the Internet data (ECNC/BIODIVERSITY SERVERS, an extract shows the status as of January 23, 2000)

Country	Mammals	Nesting birds	Reptiles	Amphibians	Freshwater fish	Invertebrates	Vascular plants
Belarus	70	208	7	-	58	10,000	1,720
Bulgaria	94	383	36	16	207	25,761	3,583
Hungary	72	203	15	17	81	41,460	2,214
Poland	85	224	9	18	66	28,384	2,300
Romania	84	249	25	19	-	-	3,350
Turkey	116	284	102	18	175	-	8,579
Ukraine	-	-	-	-	-	-	-

As it was proven above, when trying to fill in the line concerning Ukraine with the help of SoE-publications, you can face many issues arising not only because of the fact that it is possible to calculate a number of species by different ways, but also because it depends on insight and education of an implementer. It also appears that despite numerous ornithological papers, there is no up-to-date source that unambiguously would state the amount of nesting birds in Ukraine. (Instead, for some unknown reason, the indicator > 400 is wandering from one SoE to another, when speaking about the general amount of types, although they comprise already nearly **420**. For now, such approximateness would have sense only in respect to some distant, little known islands.) As for ichthyofauna, it is possible to find in domestic publications both references to 270 and 189 species (Zagorodniuk, 1999), or 184 (Zhukinsky, 1995 – Shchrbukha, 1999). The more interesting is the fact that in the National Report of Ukraine on Conservation of Biological Diversity (1997), 188 fishes were united with 2 species of Cyclostomata. Finally, in 1999 it all resulted in the statement that those fishes together with lampreys, together with subspecies, are “approximately 170” (National report., 1999, p.47)!

Finally, we have it that taking account of the Internet data that have been analyzed above, the referenced line could have the following form (although the author himself represents the

view that considering biological objects constant moving interval estimations confirmed by the indicator of reliability level would be much better):

Ukraine	108-117	260-270*	21	17	<184	44,017...44,371 (that is better than >44,000)	5,099-5,101
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* Assumption of the author (to be determined)

In respect to preparation of sections covering biological resources for SoE-sources, it is possibly the main issue. The question is that in domestic SoE-publications it is more frequently possible to find references to the main purpose – in other words, to achieve sustainable development regarding bioresources and biodiversity, at the same time the material does not respond to this purpose, either according to its volume or its contents. The main thing is not even this, but the fact that in theoretical biology it is possible to find many examples of essential restraints for the scenario of “sustainable development”, when its success is evaluated in almost 20% (e.g., Reimers, 1990; Zubakov, 1996; Glazko, 1998). It is not excluded that currently biodiversity has to be conserved more for avoiding productivity losses related to bad functioning ecosystems, rather than because of possible irretrievable disappearance of species (Glazko, 1998, p.88). So, besides the technical purpose of proper reporting, including when responding to the requirements of the Item 4a of the Article 23 and Article 26 of the Convention (1995), some reasonable functional purpose must exist that takes account of common European approaches, trends, tendencies, and forecasts.

From the purely scientific point of view, domestic SoE-sources having a particular closed character are not considered in all-European space and time, although there are no reasons to consider Ukraine beyond the limits of large-scale predictions and forecasts on changes in animate nature penetrating into the world’s literature and Internet-network, and first of all, those related to the outlined ones and the so-called *trigger effects* that are important for the issues of ecological safety.

Let us consider some of the most interesting forecasts that will be worth attention, from my point of view, in the nearest SoE-publications in Ukraine, and what is necessary to pay attention to during collection of current information.

Experts from EEA⁵ (Environment in the European Union... 1999) have recently made a sad conclusion: despite the already 25-year- existence of the program Community Environmental Policy, it has failed to change general quality of environment to the better in the EU – countries, although everybody separately did something. This is a conclusion that was hardly anticipated! The state of the component like environment is conventionally described by the symbol □ (less successful development but with features of the positive one), and the future state of environment is not reliably predictable. This is stipulated not only by the situational reasons (changes in land use, contamination, appearance of alien species etc.), but also situational reasons that will not lose their relevance until nearly 2010. Besides that, it is stated that because of climate change there is an increase of threat to mountain districts biodiversity; a number of international meetings were devoted to this issue (e.g., in England and Italy). This was also an object of sustainable development problem for mountain systems in Europe in connection to the known document *Agenda 21 –Ch 13*, which exactly in this connection is not reflected in domestic SoE-publications, although after the Toulouse meeting in 1996 Ukraine has become a leader of the movement of Prykarpatsky environmental NGOs in Europe in respect to sustainable development of mountain systems.

⁵ EEA – European Environmental Agency

According to another document - Global Environmental Outlook 2000 (=GEO-2000) - in such parts of the world as the Black Sea and the Baltic Sea, the Chesapik Gulf warming would result in large-scale algae bloom, and then in anoxaemia, and as a result, in loss of fish (Natal, 1999).

SoE-sources in Ukraine must obligatory respond to these warnings, too.

It is predicted that both in the West and in the East of Europe the amount of endangered mammals would increase (Guidelines for Data Collection..., 1996; GEO-2000..., 1999), because they respond to changes, in particular, to the land use changes, more badly; the percentage of mammals, comparing to other types of animals that are at risk, is nearly 40%. It would be shown by me below that the processes in Ukraine are not only consistent with these forecasts, but have their own specificity.

Forecasts on demographic indicators and related forest issues in Ukraine have already appeared on the Internet (see the website of "Population Action International..." program) – statistical improvement is forecasted.

It is interesting that on WCMC⁶ web-sites having a separate web-page for natural disasters impacts Zakarpattia flood issue is not reflected, which could be anticipated.

These examples are enough to see how important it is to refer to international sources of information in SoE-publications and make references to them.

Generally, a search for data on environmental state in Ukraine in the Internet, for example, using the key word "SoE" (any Internet-users from Europe or beyond its borders would act so) would factually give in result only references to a summary covering the period of 1992-1993! The first and the last summary on the state of biodiversity in Ukraine for the period of 1997 looks as a separate one. Via the web-page for GRID/Arendal (Norway) it is possible to get a link to the structure of Ukrainian report for 1996, but not to the report itself. It is quite difficult to find data on the state of biodiversity in Ukraine for the Azov - Black Sea Region for the recent two years on the Internet. So, after the first replenishment of such hi-capacity web-sites as The Black Sea Information System Black SIS /Black Sea Environmental Internet Node, NATO/Black Sea Project – Related Information and others there were nobody to continue this work since 1997. In general, we failed to find comprehensive electronic information on environmental state in Ukraine, and furthermore, on its biological resources. It is not available even on the sites of Ukrainian environmental NGOs, which allegedly were going to be on the "cutting edge" of events. In order to find information on environment of Ukraine on the Internet, a user would have to collect literally nuggets on 4 - 7 web-sites, and turn to powerful sites of international centers in England, the USA, Norway, including NASA and NATO (Prydatko, Parkhisenko, 1999), as well as to web-sites for environmental news –NEN⁷.

Additionally, other reasons for that information phenomenon were clarified by the author of this article. During special comparative analysis of environmental state reporting (Conservation and the Future..., 1997; Environmental Reporting..., 1997; Europe's Environment..., 1995; Global Biodiversity..., 1995; GEO-1997; GEO-2000; Guidelines for Data Collection..., 1996; and others), and comparison of the surveys structure of all-European and global importance the author came to the conclusion that data produced for the world by Ukraine have a more medley character, rather than well-ordered according to priorities and key words. That means that their consistency with the data of international systems is outdated, and unsatisfactory, although there are yet some achievements. For example, maybe, it is only Ukraine that disseminates specialized information on the Earth's depths. On the other hand, another section on biological resources in SoE does not cover the communication issue (this

⁶ WCMC – World Conservation Monitoring Center.

⁷ The latest information on these issues is available on the Internet – the links are provided by the author in the Appendix.

stipulates less attention devoted to the indicators themselves), as well as that on landscapes (see ECNC PROJECT: Monograph on the European Landscapes – Classification, Evaluation, Conservation - <http://www.ecnc.nl/doc/projects/landmono.html>), and *trigger effects* of biodiversity.

Other observations and remarks could be reduced to the following ones.

Hunting Animals. Experts of Grid/Arenal in 1996 found out that for the countries of Central and Eastern Europe / NIS while analyzing the state of biodiversity and landscapes for 1991-1996 it was characteristic to use more references to a number of hunting animals rather than other things (Environmental Reporting..., 1997, p.26); and Ukraine was not an exclusion in this respect until 1999. Actually, in annual SoE – publications for 1992-1998 you can find changes in amount and prey degree of elks, deer, roes, wild boars for the period of 1980-1998, and foxes, hares - for 1991-1998, and some rare changes for birds. The data are united by the fact that series mostly look smoothed, and conclusions on trends are not confirmed by the statistical analysis. This means that the most trends for the recent nearly twenty years, with a rare exception, are intuitively derived! The worst thing is that natural cyclic recurrence does not appear here, as well as relationships of the *predator – victim* type. (For comparison, in 1966-1975, the corresponding non-synchronism in quantity fluctuations was observed partly for the pairs “hazel hen – fox”, “capercailie – marten”, and “capercailie – fox” - Prydatko, 1976) – Table 2, Fig.1, Fig.2. At best, today this is a methodological omission, at worst; it is a temporary loss of features on cyclic recurrence at the population level. The author is inclined to think about other things. By the example of rare animal species of Ukraine it was noticed recently that there is a tendency to essential and nearly sustainable reduction within the number and diversity of predator species (Zagorodniuk, 1999)⁸. By the example of big hunting mammals, a low level of species quantity for nearly all their types can be observed, as well as a trend to its decrease, taking account of a high level of their economic use official indicators, which is explained by the existence of shadow business (Kryzhanivsky, 1999). It is already known that the similar one was the reason for reduction of furry animals and Ungulates reserves in the Exclusion Zone: beavers, elks, deer, wild boars, and others. On the other hand, cessation of economic activities and hunting in the area supported renewal of the number of mammals, for example the lynxes, and, possibly, the desman (Balashov and others, 1999).

The Exclusion Zone demonstrates quite opposite tendencies in this case, that is why the issue of moving bison, moufflon sheep, fallow deer, brown bears, Caucasian goats, and Przhivalsky horses to the area is being discussed more actively (Arkhipov and others, 1999; Akimov and others, 1999).

Theoretically, dynamics of changing the number of forest hunting animals could be closely connected with the whole range of dynamic indicators of Ukrainian forest land proportion, as well as changing “green” (forest) areas integrity. But such data are not available for now. And this relation is more likely performed in nature in such way when it is purely subject to detection by statistical means. As for hunting species, it is balancing between the natural and artificial one.

These phenomena, first of all, must be investigated and illustrated in the following SoE - publications. How hunting animals attractiveness for hunters is changing in reality is also very important. For example, Kyiv Oblast is characteristic for elks, wolves, hares, squirrels, martens,

⁸ On the contrary to this point of view, for example, in the SoE-98 it is possible to find that the number of hunting animals on hunting grounds is being decreased because of contamination and spreading poachers, and predators (National Report ..., 1999, p.48).

beavers, musk-rats, otters, minks, and raccoon dogs, but the hunters prefer to hunt merely for wild boars, hares, and wolves. ("Fakty", 10/16/1999, p.10). Among interesting facts one is worth attention; it shows a statistical increase in hydrophobia cases in connection with an increase in foxes number: experts point out that on the area of 100 hectares their density is 25 times more than that allowed by veterinary norms ("Fakty", 12/23/1999, p.10); an increase in danger of forest dogs having become wild right up to attacking people ("Fakty", 11/16/1999, p.10).

By the way, the Fig. 3.7. to the NR (National Report...,1999) does not represent any considerable increase in this species number, and, furthermore, any logical "predator-victim" type consistency with a drastic increase in the number of hares! But such consistency of both trends would be visible in the document "Draft Interim Report. Environmental Performance Reviews of Ukraine" (under development), which was preliminarily shown by EEC experts in Kyiv. This is one more example for the fact that there is a problem of information statistical processing, and increasing its clearness.

Forests. Any new data on essential changes in the state of forests for 1999 are not available, that is why it is not necessary to repeat for SoE again and again one and the same histogram illustrating changes in the percentage of forest land since 1946, and draw a series up to the variant of 15,6% for 1999. Most forests indicators for Ukraine have been improved (except for those for Zakarpattia). The special feature that is really noticeable for various publications is that there are references to the fact that 1.7 million hectares of oak forests are considered to be the "golden fund" of Ukraine, which nowhere else in Europe is available, and fore-forests are widespread here. Why not to continue this topic further?

Some new publications with non-standard summarizing have appeared. In 1999, it was indicated that during half a century, the most essential changes have taken place in forests of state importance, which share makes up 99.4% comparing to 1946. It was also indicated that contradiction between forest resource potential buildup and use remains the main problem. In particular, that becomes apparent for the lowest (for the after-war period) indicator of a calculated wood-cutting area of main use – 5.3 million m³ per year, taking account of its under-use by 13-15%. It was also indicated that the problem of rationalizing the use of lumber remains relevant (Baitala, 1999). Certainly, there are many other problems left. For example, the problem of an increase in percentage of forest covered land for field and water protection purposes (the latter makes up in Polissya about 26.5%, in the forest-steppe region –12.9%, for the steppe- 4%, at the same time, the optimum one would make up 28-19-17%% correspondingly). In the aspect being under our consideration, the most topical is the issue of support of forests ecological capacity and ecotonic characteristics, which is now actively discussed by experts, including via Internet (e.g. Ecotones Play Large Role..., 1999), but absolutely not concerned in our SoE –publications and is indicative for such aspect as revision of species diversity, "construction" and survival of the ecological network.

Table 2. Comparison of conclusions on hunting animals number change in Ukraine according to literature sources data for three conventional periods of 1966-1975, 1985-1989, and 1992-1999.

1966-1975 (Prydatko, 1976)

Intuitive Assessment:

- the number of wild boars in the north –west of Ukraine apparently increased;
- the number of raccoon dogs was reduced;
- the number of martens was reduced;
- the number of capercaillies has been reduced since 1971;
- the number of foxes, hazel hens had a complex changing character, but clear non-synchronism in number fluctuations was characteristic for Volyn Oblast (see. Fig.1).

Statistical Assessment:

- a reliable (P=99%) negative correlation ($r = -0.879$) existed for the pair “capercailye – fox”;
- for the pairs “capercailye –raccoon dog (wild boar, marten)”, “hazel hen - fox (wild boar, raccoon dog, marten)”, the correlation coefficient fluctuated from 0.028 to 0.546, but was not statistically reliable.

1985-1989 (Zastavny, 1994)

Intuitive Assessment: [assumption on the assessment method –V.P.]:

- the livestock of ungulate animals grew by nearly 20%;
- the number of furry animals decreased by 14%;
- the number of capercailyes decreased;
- the number of black grouses increased;
- the number of partridges, wild geese, and wild ducks significantly increased.

1980...1992-1998 (SoE-publications - National Reports on the State of Natural Environment in Ukraine for 1992-1999) and others

Intuitive Assessment: [assumption on the assessment method –V.P.]:

1980-1990

(See: Конференція ООН Навколишнє середовище і розвиток..., 1992 (UNO Conference Environment and Development..., 1992))

- The actual number of many species of hunting animals is 3-5 times less than the optimum one, despite the growth of livestock of hunting animals main types (ungulate animals –V.P.)

1991-1995

(See: Охорона навколишнього ...1994-1996, 1997 (Protection of Environment...1994-1996, 1997))

- the number of elks and wild boars decreased
- the number of foxes increased
- the number of wisents, deer, and hares became stable

1995-1996

(See: Україна в контексті “Порядку денного...”, 1998 (Ukraine in the Context of the Agenda..., 1998))

Citation: “...winter complex conditions of 1995-1996 caused significant reduction in the number of animals... especially in mountain areas... Reduction in the number and prey degree of hunting animals has occurred recently comparing to previous years. This happened because of worsening economic situation... a decrease in animals protection level, and because of wintering complex climatic conditions for animals in 1995-1996.

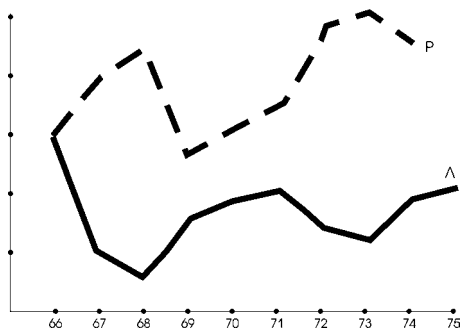


Fig.1. Fluctuations in the number of foxes (JI), and hazel hens (P) in Volyn (left) and in Ukraine (fragment - right) in 1966-1975.

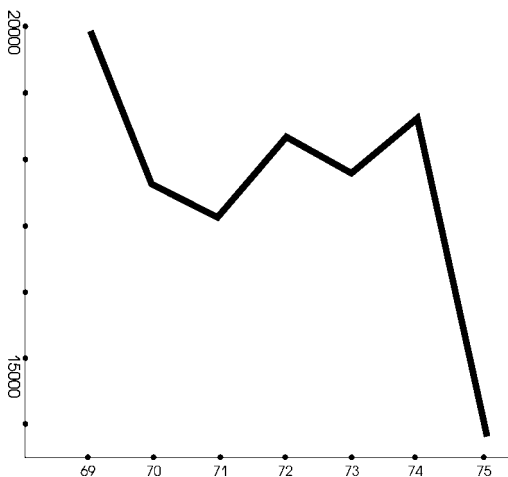
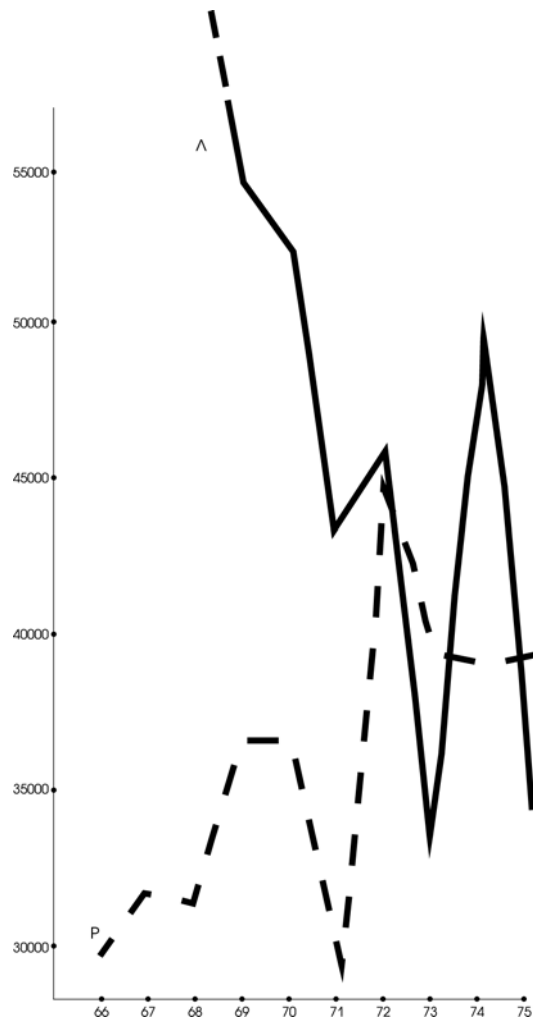


Fig.2 Fluctuations in the number of martens in Ukraine in 1966-1975.



According to Internet data as of December 18, this year (the web-site of “Population Action International” program), it is forecasted that for Ukraine this indicator as the “forest quantity per capita” will increase at the following rate: from 0.18 hectares per capita (1995) up to 0.21 hectares per capita (2025). So, because of the known demographic crisis in Ukraine, there could be another effect of particular statistical improvement of any particular indicator. This topic deserves to be significantly highlighted in SoE-publications, as it was the case with a positive statistical role of economic crisis that influenced water and air pollution indicators.

In 1999 mass media raised the issue that forest raw material could be an effective type of fuel of local importance in Ukraine, taking into account real rates of reduction in main energy carriers extraction. The issue is considered in respect to forecasted permanent growth of demand for timber as a kind of fuel in Europe for the period up to 2020 (Baitala, 1999). This is an entirely new revolutionary aspect for SoE-publications related to some provisions of the Kyoto Protocol and tactics of Clean Development Mechanism + Implementing Voluntary Mechanism (“clean technology”). According to Internet information, analogical issues of timber and crops importance started being discussed in the context of U.S. budget for 2001 (Top Stories Headlines., 1999).

Rare and Endangered Animals and Plants (of the Red Book). In publications on the state of Ukrainian environment issued in 1992-1998 the review of this component looks like a fragmentary and not interesting compilation, but with rare exceptions (See: National Report of Ukraine on Conservation of Biological Diversity (1997); Zagorodniuk, 1997, 1999). An increase in the number of animal and plant species listed in the Red Book of Ukraine is described traditionally. These figures have been stated after the first (1980) and last (1994-1995) editions of the Red Book of Ukraine, and further are wandering from one publication to another without changes, or even with mistakes for 1-3 species.

Today we have the important fact that discrepancies between the date of the book publishing and the date of conventional fixing the status quo made up in both cases 3-5 years. Practically, this is the way of things for about 16 years, i.e. for the period of 1976-1992. Then, it caused extension of the vascular plants list 2.9 times as much, and as for the animals list – 4.5 times as much. The list grew with the average rate of 3.5 times, and with the speed of nearly 51 species a year, which is impossible for Europe. If we take a look at the list of references for the second edition, for the most cases, scientists have already succeeded in drawing a line for 1988. So, the conventional speed was even higher. Generally, the range of cited literature included, for example, 1896-1960 (hydroid polyps), 1952-1987 (molluscs), 1959-1988 (reptiles), and at the same time, 1832-1988 (insects), 1851-1991 (birds) etc. We can see, how ambiguous the conclusions on well-being of species entered into the Red Book only in 1980-1995 may be.

Anyway, in Western and Eastern Europe the number of endangered mammals is growing (Guidelines for Data Collection..., 1996; GEO-2000..., 1999), as they more painfully react to changes, for example, in land use. Their proportion among other animal species is the biggest - nearly 40%. Almost the same situation was in Ukraine: 39.7% (National Report of Ukraine..., 1997). What is important is that already in 1999 at working meetings in Kyiv experts from EEC⁹ concluded that considering the state of science for 1994-1995 nearly 9% of vascular plants, 38.0% mammals, 38.1% reptiles, and 29.4% amphibians in Ukraine are at risk with respect to the state of these species according to IUCN classification¹⁰ (Draft Interim Report...1999, under development). It was predicted that with account of historical traditions the percentage of the Red Book mammals in Ukraine could further reach over 50% (Zagorodniuk, 1997). There are prognoses for an increase in the number of fish taxons in the Red Book of Ukraine – from 18.3% to 23.9% (Scherbukha, 1999).

But there was little attention paid to the fact that, despite the bright demonstrable character of mammals, despite the entire collection of SoE-publications, even despite availability of the Red Book of Ukraine, it appears that for some reason there are no data concerning Ukraine on the global map of endangered mammals. This map showing the status for January, 2000 “is hanging” on the Internet on the *Scientific American* web-site and was developed by WCMC-IUCN in 1994-1996.

According to this map, Ukraine is located in such statistical domain which is characterized by the amount of 10-14% such mammals for the whole country (Scientific American Analysis Threatened Mammals..., 1997). Referring to more precise data of I. Zagorodniuk (1999, p. 72), where for the first time for the past years you can find that there are 117 mammal species in Ukraine, (and not 108 – see: the National Report of Ukraine..., 1997; Draft Interim Report..., 1999, under development etc.), we can calculate nearly the similar value – 16%. As it is shown below, the same chronic mis-accounting of data on Ukraine has been recently detected by the example of the Red Book plants.

⁹ EEC- European Economic Committee.

¹⁰ IUCN- International Union for Conservation of Nature and Natural Resources. Here “endangered, vulnerable or rare species” are meant.

Attention should be paid to the fact that up to 1999 some original non-replicated data on the Red Book species appeared only for inhabitants of the Black Sea, when 19 algae and 100 animal species in Ukraine were entered into the Red Book of the Black Sea (it includes 254 species). It was thought that 8 more plant and 58 bird species from Ukraine were associated with those (Alexandrov, 1997; Black Sea Environmental Internet Node ... 1999). Taking into consideration the existing rates of ecosystems recreation and destruction in the coastal zone (see below), these groups of living creatures can really find themselves in a complicated situation. In 1998, there was stated with a 15-year delay that one endemic species of the Crimean beaches had disappeared – *Echinophora sibthorpiana* (*Apiaceae*) (Jena, 1998). On the other hand, A. Jena confirmed in recent years that 2 species being considered disappeared have appeared: *Lepidium Turszaninowii* and *Traechomitum tauricum* (Didukh, 1998). In official sources the conclusion was made for SoE-98 that the Black Sea biological resources do not have any tendency towards their improvement (National Report..., 1999). Press paid attention to risks for animate nature of the Crimea (KYIV POST, December 02, 1999).

In 1998, IUCN issued the first “Global Red List” of the world’s rare and endangered plants. As it was analyzed (Mosiakin, 1998), by some mistake only 52 species of vascular plants are officially indicated in the list for Ukraine, although there are references in the text to nearly 108 taxons, but even that number must be doubled. This mistake was explained by S. Mosiakin by the fact that for many species a habitat is indicated according to the old political division: “former USSR”, “former European USSR”. Generally, as it can be seen from essential summaries of information on world resources (for example, Europe’s Environment: Statistical Compendium..., 1995; Global Diversity Assessment..., 1995), ecological statistics of Ukraine will be threatened by this linguistic barrier during a long period in future, if scientists do not timely publish or summarize their scientific data in English, French, or German.

The similar situation was during the times of the former USSR that is why there was a negative tradition to do everything through Moscow institutions. The author had a unique chance to be convinced in 1994 in Nairobi at the fourth Meeting of Parties to the Bonn Convention that the Scientific Council of the Convention when working over new appendices texts on birds outlined the situation in the former USSR countries, including Ukraine, based on the works of mainly Moscow professionals prepared during the 50-s - 80-s. (Proposals for Amendment of Appendices I and II...1994). Unfortunately, such works published in a small amount of copies (up to 200 copies) and having great volume are not known to Ukrainian ornithologists community at all, that is why they can not do corresponding conclusions timely.

Otherwise, there would not be the case like that one occurred when experts of Birdlife International, when preparing an encyclopedia collection on birds of Europe and analyzing trends concerning, for example, *Falco naumanni*, faced revolting non-objective data on Ukraine – 200-300 couples of nesting birds. They called this information anecdotal (Tucker, Heath, 1994, p.188). In 1997, the author intentionally analyzed this case (Ukraine/Group of Experts on Conservation..., 1997). He found out that foreign experts had nearly no chances to find the range of values close to real ones; these are 3-5 couples of nesting birds. In order to achieve that result, they would have to look through a pile of specialized ornithological literature published in a small amount of copies in 1988-1996. They would have to be lucky to pay attention to at least five Russian and Ukrainian articles and messages issued in Odessa and Kyiv, the shortest of which contained six sentences and was published in the journal “Life of Birds” (Kinda, 1995). Finally, even if they had managed to make references to the Red Book of Ukraine, 1994 that would have resulted in a wrong data – up to 100 nesting couples in 1988. With the help of this example we can see what distance may be between traditional compilation and expert assessment.

In 1999, for the first time, positive data were published on the state of the Red Book species in the Exclusion Zone (Balashov and others, 1999): 23 plant species, and at least 30¹¹ animal species of that category are available and in satisfactory condition. An increase in the number of the Red Book water plants was noticed: water nut *Trapa natans*, *Aldrovanda vesiculosa*, *Salvinia natans* – and an increase in their habitats, the same is for predator birds and mammals. Species having been constantly affected by mow cleaning and grass burning, devastation, pesticides use, interferences etc. also demonstrate an improvement in their state. In a whole, predictions for development of local fauna complexes seem to be optimistic. Again, reference to the fact that poaching remains a negative factor in the Exclusion Zone is very unusual for Europe.

It is not yet the time for statistical evaluation of that factor influence at SoE level, and for attraction of attention to it in order to prevent it from becoming “a Y2K problem”!

Reserves and use intensity for biological resources and biodiversity. It should be recognized that this direction in research is quite complex, and possibly, is not very well developed in domestic SoE-publications. Despite this, already in 1997 one of documents of the Convention on Conservation of Biodiversity (e.g. Recommendations for a Core Set of Indicators, 1997) draws attention to necessity of receiving NCI (national index of natural capital), and indicates the way to it. The degree of development of NIC-trends would be really a lucky finding for developers of geoinformation systems for SoE. In this respect, it is important that in Ukraine approaches were already proposed to indicate a component structure of natural and resource potential, including for such biota components as forest and fauna (Rudenko, 1991 – by Zastavny, 1996, p.93). According to these data, the biggest proportion belongs to land resources (44%), and the smallest one – to fauna resources (0.5%). This interesting example on the work with NIC calls our attention back to discussion on the final aim of sections on biological resources in SoE, and in this way is also able to essentially influence the further approaches to materials search and presentation.

The second remark will also refer to the problem of improving the level of resource data interpretation and providing proper orientation, and acuteness. The issue of the journal “Newsweek” in December 1999 published outcomes of the World’s Economic Forum work in Davos in January, 1999. In this paper attention is attracted to the fact that developing countries are characterized by 80% use of wild flora and fauna as a basis for their medicinal self-servicing. It is known that in Ukraine at least in 1995 and after that there was a stable tendency towards reduction of natural resources of wild plants, their natural habitats under existence of the stable demand for them in the pharmaceutical industry of Ukraine (National Report., 1997). Maybe, it is time to proceed from dull tables, where everything is proven, to analysis of the process social and economic results in order to move away from repetitions and mistakes provided by compilation. (For example, in SoE on the p.41 it is indicated that in Ukraine there are **1075** species of vascular plants having medicinal characteristics, and on the p. 42 there are already **1200!**)

The third remark will refer to such scientific problem as transfer from NIS to summarized cost indicators of biodiversity and biological resources that is not available in any SoE-publication. Amounts of fines and expenses are only a hint to the real price. For example, according to estimations of the Russian Economic Academy named after G. Plekhanov, the cost for potential raw material reserves of Ukraine makes up 7.6 trillion US dollars (Glazko, 1998, p.84). What proportion of these calculations belongs to biological resources is possible to find out by guessing only.

¹¹ In the same collection of papers by M. Arkhipov and others (1999) it is stressed that 38 species of animals entered to the Red Book of Ukraine, and 207 species to the Bern Convention provisions should be under consideration.

Objects and areas protected (OAP), and their actual importance. 1999 year stated an increase in the number of protected natural areas in the world, which can be considered as an evidence of worsening the state of nature in general (GEO-2000, 1999). In that case, the situation in Ukraine is not the worst, because Ukraine is characterized for constant growing the number of areas belonging to OAP at the rate of nearly 70,000 hectares per year, (in 1972-1999) – it is fantastic! - and the percentage of OAP as of 09/01/99 made up 4% (Nature Conservation in Ukraine, 1999). The following facts are also worth attention: a) the number of OAP grew 5 times as much for the period of 1972-1991 (UNO Conference, 1992, p.33), but the number of the Red Book taxons during almost the same period of 1976-1991 increased approximately 4 times as much (see above). In respect to the world's OAP experience, this process may occur in a more effective way than it may be analyzed by the example of, let us say, Ukraine. When commenting some forecasts regarding an irrevocable increase in OAP percentage in Ukraine (~8-10%%), it is necessary to say that this will happen simultaneously with the growth of percentage of the Red Book and “rare” taxons.

Perhaps, something is wrong not only with statistics, but with approaches to successful evaluation. Against the background of such statistical improvement of the protected areas network, it is quite surprising that indicators for Ukraine on the Internet do not correspond to the reality at all. If you get access through the link on WCMC web-page to the United Nations List of National Parks and Protected Areas <http://www.wcmc.org.uk/cgi-bin/pa_paisquery.p>, you can find there that already in 1980 OAP percentage made up 8% in Ukraine. At the same time, the new section “1996 Global Protected Areas Summary Statistics” according to data given on February 4, 2000 at http://www.wcmc.org.uk/protected_areas/data/summstat.html> states 0.87%!

Other demonstrable animal species. According to a source (Europe's Environment: Statistical ..., 1994), experts agreed that a situation in Europe could be easily assessed using data on nesting of **39** bird species (*Podiceps cristatus*, *Ardea cinera*, *Nycticorax nycticorax*, and others), which is impossible to get from our SoE. It is interesting why we do not act so, and why this information is scattered. The same demonstrability is characteristic for the birds from “The List of 23” in SoE. For these bird species there are good summaries composed through analyzing more than 150 information sources and survey data (Ukraine/Group of Experts on Conservation..., 1997). When reading attentively the materials, you can notice a continuous negative trend of change in quality of ecosystems and landscapes.

Biodiversity and biological resources in agrarian sector. Recently, this topic has been very actively discussed in Europe taking account of not only the fact that there is a territorial, special aspect of the matter, but also considering the fact that the document CBD-CCP4-Decision IY... (1997) covers this topic. For Ukraine, it is an important cross-section in respect to environmental policy, because OAP cover not only 4% of the territory. According to publications, you can already feel that enthusiasm of the 90-s in Ukraine is over. That was the time when people said that OAP could be a guarantee for conservation of even 80% of Ukrainian flora and fauna species (National Report..., 1992, p.108, National Report..., 1993, p.150). As a matter of fact, the area of arable lands in Ukraine makes up 55%, and the most part of biodiversity has been subject to forceful transformation into biodiversity of agrarian landscapes (Prydatko, 1996). Governmental documents mention that agriculture of Ukraine is a domain dealing with nature more than other branches (see, for example, the Decree of Verkhovna Rada of Ukraine as of March 5, 1998 No. 188/98-VR). That is why it is possible to imagine what qualitative effect rehabilitation/conservation of all 634 soil types, or 4,000 taxonomic soil units of Ukraine could cause. Now, in the process of land reform implementation it becomes more and more acute. The outlined document “CBD-CCP4-DecisionIY...” calls attention to the fact that was forgotten by everybody in surveys on environmental state – **pollinators and soil microorganisms**. At the same time, it is already impossible to detect the azotobacter being an

indicator and one of soil fertility factors in the significant amount Ukrainian soils (V. Patyka, personal information). It is rarely possible to find a publication on necessary preservation of soil algae (Kostikov, Darienko, 1997), phytocoelelminths (Kozlovsky, 1997), micro-arthropods (Caprus, Melamud, 1997), and others. This information is not mentioned in any of introductions to any recent environmental legislative acts, or scientific substantiation to those. This problem requires urgent consideration and decisions to be rendered. It is closely connected with the problem of genetic and toxic risks in the agricultural domain.

To stress convincing information on nature capacity of the domain, a dominating role of land resources in the component structure of nature and resource potential, it is necessary to recollect one more observation by V. Glazko (1998, p.81). It says that agriculture has already become a system having features of that able to self-organize.

GMO¹². Perhaps, for the first time, this issue was referred to in the National Report of Ukraine (1997) and considered to the extent sufficient for the first step.

In future, it was impossible to understand anything only from SoE-publications. At the same time, even taking into account messages on the Internet (Key Data on GM Food in the European Union, 1999; WTO 'Seizing Control of GM Trade', 1999, and others), this matter has becoming more and more visible and is considered in respect to medicinal herbs, pharmaceutical industry, and agriculture (growing potatoes, soy beans, corn, tomatoes, and others) – BLOWATCH (2000). A list of sources on the Internet (ICGEB Biosafety WebPages) makes up almost 2,000, and a list of meta database includes "OECD (Biotrack)", "Australia (GMAC)", "Argentina (CONABIA)", "Brazil (CTNBio)", "Canada (CFIA)", "EU (JRC)", "Germany (RKI)", and "USA (USDA/ISB)".

Ecological systems. Among materials having been not referenced in SoE-publications until 1999, but being worth attention, the following should be referred to: percentage of steppe species in meadow flora of the Middle Prydniprovyia steppes has decreased by nearly 4% (19 species) during the former century (Pestova, 1997). Great changes can be found in flora of the Crimean southern coast; in particular, a list of endemic species is under changing now. Penetration of 6-7 new species¹³ has been noticed, mainly because of destruction of natural ecological niches and formation of qualitatively new ones, which is caused by recreation, urbanization, and negative changes in natural ecological systems, as well as by fires (Didukh, 1998). Scientists dealing with the Exclusion Zone have provided interesting data. In publications for 1999, attention is paid to the fact that for the period of the recent 6 years renewing deciduous and coniferous forests has been taking place on open lands of the Exclusion Zone (Arkhipov and others, 1999).

This cross-layer fits best English versions of SoE-publications available for demonstration on the Internet.

Epizooty and others. The epizootic component is represented in SoE-sources not enough, on the contrary to street media. By the example of such media, it is very well seen what is of public significance for SoE. Here are some interesting extracts. In 1999, 444 cases of hydrophobia were stated for domestic and wild animals, 72 incidents of leptospirosis, (the most dangerous district in this respect was Zgurivsky district in Kyiv Oblast, where 5 centers of hydrophobia were indicated ("Fakty", 12/23/99, p.10)), a pig farm in Puscha-Vodytsia near Kyiv, where an outbreak of leptospirosis was stated, and in Khersonsky oblast, where anthrax was observed ("Fakty", 11/11/99, p.7). 28 wolves, 468 foxes, and more than 11,000 stray dogs and cats were shot in hydrophobia centers ("Fakty", 12/23/99, p.10). It is important that epizooty prove an open character of forest and cross-border forest ecosystems, an existing migration scale of wild animals, and their interaction between domestic and stray ones: the list of

¹² Genetically modified organisms.

¹³ Mentioned are species brought from other regions (America, Asia, etc.)

interacting animals includes pigs, foxes, dogs, cats, and raccoon dogs. It is recognized that epizooty can be caused in Ukraine by spontaneous markets that keep on appearing along the roads. These markets in 17 cases became sources of botulism because of dried fish (“Vechirniy Kyiv”, 12/07/99, p.3; “Fakty” 12/07/99, p.10).

Fish resources and fishery. References to negative trends rather than positive ones are more characteristic for SoE-Publications on this problem for 1992-1999, which was actually reasoned. EEC experts paid attention to the fact of an essential decrease in fish catch in internal waters of Ukraine, and reasons of the phenomenon (Draft Interim Report... [under development]). A share of fish catch in the whole volume of catch for the period of 1990-1997 was fluctuating in the range of 9.4%-43.6%. This range is so big that from a statistical point of view it shows drop-out variants, such as [9,4%]. That is why today there are reasons for believing that this trend was much more illusory than it seemed to be. According to external features, supply of population with fish from local sources (via market) did not change for the same period. This looks like a shadow situation with hunting animals (see above). It is important to pay attention to the fact that our SoE-sources (for example, the latest edition for 1999 outlines the situation of 1998) avoid revealing the fact of depleting fish reserves, but at the same time provide figures that allow imagining the volume of such depleting - a really catastrophic one. The volume of poaching in fishery makes up 50 tons per year, which causes losses of up to 100,000 hryvnias per year (UT-1, “Zone-Z”, 02/10/00).

What is also characteristic is that in the abovementioned reports it is difficult to find any objective information on how many fishes are available in Ukraine.

Y2K Problem (2000-problem), and biological resources and biodiversity. Such combination of topics is a rare possibility to see an example of an outlined socio-ecological effect. Namely, in this context, in the late 1999, the problem was not discussed in Ukrainian mass media, but the author is aware of a single non-announced case of preparing a draft article on this matter for a magazine in December, 1999. Because of an unsatisfactory argumentum, this case has not found continuation. On the whole, for example in the USA it was recognized that Y2K problem risks for Ukraine were exaggerated (Y2K Problem in Ukraine... 1999). So, that socio-ecological effect has not come true.

Biological diversity, cities, and populated areas. This is a usual topic for foreign SoE, but it is not very well represented in the domestic ones, at the same time, it is suits analysis of the topic “SoE and Press”. This aspect is very important, as biodiversity grows during urbanization, but this process takes place in such way that, for example, in Odessa, there is leveling of flora and its unification (Kovalenko, 1997). Cities and populated areas essentially influence the population of birds (Lopariov, 1997), and ground mollusks (Sverlova, 1997). It is also well known that living beings destruct constructions and communications. Bacteria and hydrogen sulphide quite often cause destruction of the underground walls and constructions. In 1999, it was indicated that they had fully spoiled concrete and fittings of a sewage-stilling basin near Chernihivska underground station (“Fakty”, 11/30/99, p.10). Mice digging holes also had destroyed a barrow near the city of Kakhovka (Kherson Oblast), which caused danger for the monument “Tachanka” (VSEUKRAINSKIJE VEDOMOSTI, 14/05/97, p.11). *Stray animals.* Currently, in Ukrainian cities thousands of stray animals are available, which could not be unconsidered. A particular observation: in 1999, the author noticed in Kyiv that dogs used underground crossings. This is a small but excellent example of ecological corridors functioning. Proper use of special constructions by animals to avoid death on roads is the problem specialists are dealing with everywhere in Europe.

Global problems (climate change, and biodiversity and biological resources state change), and solar-earth relationships. This aspect is considered very indirectly in SoE-publications - because of demonstrating forests significance and CO₂ accumulating role of some natural

habitats. Special attention should be paid to this aspect, which could provide new material and new observations.

CONCLUSIONS

Significance and value of national SoE-publications is constantly growing. By many parameters, excerpts are starting to be compiled in the form of series of 5-20, and more variants, which soon will let apply more powerful instruments of biometry than it is allowed now. powerful tools of biometry that the circumstances allow. It is clear that in future researchers will be trying to find materials for prognosis: trends and tendencies increasing responsibility of articles and SoE-publications authors. A current and accurate account of failures is a necessary condition for improving their future work. With the view of statistical analysis principles the work over SoE should be joint. Today, the data matrix of national ecology looks like a sieve, and using, let us say, factor analysis is a matter of future. For today, statistics of small excerpts is more suitable for it. Such kind of statistics is more characteristic for astrophysics than modern ecology.

Taking into account a growing collection of SoE-publications, and their potential public significance, it makes sense to pursue more actively activities on constant analyzing the phenomenon that mass media (that is an indicator of demand for information), on the contrary to scientific articles, not always consider mutual topics: they initially have different users. For example, today it is easier to find data on domestic animals quantity in the street press, rather than in SoE sources (which make basis for some calculations on CO₂, and CH₄ extraction, wastes etc.), or data on numerous cases of zoo animals losses, or the quantity of animals in cities (that shows a real situation in ecological education and culture, mass daily problems could be material for study of epizooty, and even phenetics phenomena).

According to the author's opinion, and taking account of used by him excerpts of 68 publications, information derived from dozens of Internet web-sites, press and television data, there is the risk **in Ukraine for today that the process of “virtual biodiversity” regulation is entering into force – that is the biodiversity which public significance is not determined and monitoring of it is performed, for the well-known reasons, with noticeable restrictions and delay.** Hence, theoretically, long-term planning of activities (for the last time it is up to 2015!) on this nature protection trend cannot be reliable; the legislation would require complex correction.

The content of the article shows brightly that Ukraine is insufficiently represented (perhaps, only for 30-40%%) in the international information field in respect to the state of biological resources and biodiversity. Moreover, informational fullness of such reporting materials is behindhand, in comparison to such countries as, for example, EU-countries. The situation can also be explained by insufficient development of the biodiversity indicators issue, as well as some non-professional methods in reporting and sharing information, for example, on the Internet. The information sharing is performed with WCMC, IUCN, ECNC, and CBD/CHM, and generally does not require greater expenses. An incidental result is represented by the lack of integrated biodiversity indicators, and cost estimations in Ukraine, as well as discrepancies between some statistical data on Ukraine and the entire all-European information field. In other words, how could it be explained that, despite our internal assurance, despite all our programs and draft programs, ECE experts have found it necessary to mention that in 2000 in Ukraine BIODIVERSITY MONITORING STRATEGY should be developed and properly funded (Rec.11.7. – Draft Interim Report [under development]).

SoE-98 warns about the similar danger to indicators, which states that “...the current Ukrainian system of statistical environmental reporting is not focused on assessment of ecosystems response to man-caused influence and critical parameters of influence of particular

ecosystems, and population groups, but reflects...volumes of polluted substances, and cost indicators of compliance with the environmental legislation and planned parameters for environmental actions performance.” (National Report..., 1999, p.148). So, as it was represented by the article above, we have already been caught by the trap of managing “nature-2”. The worst is that everything happens simultaneously with drastic reduction in the “quoting index” for Ukrainian scientists works - being very low anyway (0.46) in 1995-1998, it decreased to **0.06** in 1999 (“Zerkalo Nedeli” (Weekly Mirror), #5, 2000) - and information cost increase.

Logically, every next SoE-publication can improve the previous one, and information cost for every square centimeter of its area is growing today. In future, any histograms, for example those of 10x15 cm size, can not run without statistical support, or a map on birds migration ways, for unknown reasons scanned from sources of the 60s (striking passion for ornithology). In future, there could be more spatial information characterized for visualization available, which is acquired using, for example, remote sensing methods.

“Virtual biodiversity” is a new phenomenon for our society subject to economic discords. As a matter of investigation it has a high absorption coefficient in regards to efforts and expenses.

This new problem urgently requires attention by skilled professionals.

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- **The National Report on Biodiversity Conservation 1997 (English)**
- **Environmental Monitoring System in Ukraine 1997**
- **Environmental Information Systems in Ukraine**
- **The State of the Environment and Activities in Ukraine 1992-1993**
- New!!! **Report on the State of the Environment in Ukraine 1996**
- **Ukraine. Habitat and the Human Environment 1996**

New!!! <http://www.unece.org/env/epr/ukraine/ukr-rec0.htm> **EPR Recommendations made to Ukraine by the UN/ECE Committee on Environmental Policy**

<http://www.nato.int/ccms/p00/websites.htm> **Black Sea Project - Related Information**. Global Environment Facilities' (GEF's) Black Sea Environmental Programme (BSEP)

<http://www.wldelft.nl/projects/black-sis> The Black Sea Information System BlackSIS

<http://www.grid.unep.ch/bsein-> **Black Sea Environmental Internet Node** mirror site

<http://www.grid.unep.ch/bsein/redbook/index.htm> -Information About The Black Sea Red Data Book

Report of First Meeting of the Advisory Group on the Conservation of Biological Diversity "BLACK SEA RED DATA BOOK"

<http://www.domi.invenis.com.tr/blacksea> - **Black Sea Environmental Programme Home Page Save The Black Sea]**

http://www.wcmc.org.uk/data/database/un_combo.html WCMC- Protected Areas Information. Ukraine:

http://www.wcmc.org.uk/cgi-bin/pa_paisquery.p

Ukrainian language information:

New!!! CIESIN Ukraine Node- **Report on the State of the Environment in Ukraine 1996 (Ukrainian)**

For download Windows' Cyrillic fonts [click here](#)

CIESIN Ukraine Node- **The National Report on Biodiversity Conservation 1997 (Ukrainian)**

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http://www.ic-chernobyl.kiev.ua/links_ - List of sites of the Chernobyl Information Centre

http://www.rainbow.gov.ua_ - List of the sites' information resources on ecological safety of the National Security and Defence Council of Ukraine

<http://www.geocities.com/Vienna/Opera/2200/index.html> – List of ecological sites of Prydniprov'ya Youth Ecological League

<http://www.ukma.kiev.ua/univ/fac/FNS/ecology/olena.htm> – List of sites of Ms.Olena Maslukivska (Kyiv Mogyla Academy)

<http://www.ic-chernobyl.kiev.ua> - Chernobyl's Information Center

<http://www.proeco.visti.net> - "ELVISTI" Ecological Site

<http://www.rada.kiev.ua> – Legislation of Ukraine - Verchovna Rada of Ukraine web-site

<http://www.greenfield.fortunecity.com/hunters/228/pressc.htm> – Press-center of Ministry of Ecology and Natural Resources of Ukraine