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Russia's protected areas: a survey and identification of development problems

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Natural habitat preservation, i.e. the creation and management of Protected Natural Areas (PNAs), is one of the most important forms of biodiversity conservation. The most widespread types of PNAs in Russia are Zakazniks (State Nature Refuges) and Natural Monuments, but unlike Zapovedniks (State Nature Reserves) these types of Russian PNAs are little-known to foreign ecologists. Thus the main attention of this article is given to the problems of Zakazniks and Natural Monuments while other types of Russian PNAs are mentioned briefly. In many regions of Russia, Zakazniks and Natural Monuments are considered to be the core components for the regional protection of biodiversity. Non-Governmental Organizations play an important role in the creation and management of PNAs. The recent sudden change of circumstances in Russia have given rise to many problems which threaten the existence of Zakazniks and Natural Monuments. Possible means of saving these PNAs include : (i) promoting the interest of local people in protecting biodiversity; and (ii) supporting local authorities, and public initiatives and regional programmes in the creation of local PNA networks.

Keywords: protected areas; Russia; non-governmental organizations; biodiversity; conservation.

Introduction

Most rare animal and plant species in Russia have decreased in numbers and their ranges as a consequence of the destruction of natural habitats. This has resulted in about 49% of terrestrial vertebrates and nearly all invertebrates, plants, fungi and lichen species and subspecies being listed in the Red Data Book of RSFSR (1983, 1988). In the most

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developed regions of the country the effect of habitat destruction is even more prominent. Thus, natural habitat preservation, i.e. protection of particular territories, is the main form of biodiversity conservation.

The most well known type of PNA in Russia is the Zapovednik (State Nature Reserve) – Russia's symbol of nature protection (Weiner, 1988). National parks, familiar to foreign ecologists, are relatively new to Russia but Zapovedniks provide a similar role in biodiversity conservation. However, the most widespread types of PNA in Russia are Zakazniks (State Nature Refuges) and Natural Monuments. In most well-developed or intensively developing regions Zakazniks and Natural Monuments are considered the principal, core component for the regional protection of biodiversity and providing a PNA network (Sobolev, 1982a, 1988a).

The current state of Russian Zapovedniks and National Parks has been described in a review compiled by WWF (1994) with contributions from more than 100 specialists, including some of the present authors. Thus in this article the main attention is centred on Zakazniks and Natural Monuments.

Identifying the criteria for the creation of Protected Natural Areas

One of the main criteria in our selection of territories suitable for protection is their low rate of anthropogenic disturbance in conjunction with high native biodiversity.

It is apparent from the results of a number of studies on plants and animals (Harper, 1969; Kazanskaya *et al.*, 1977; Nadezhdina, 1978; Butiev, 1981; Sobolev, 1982a; Zhigarev, 1993), that human impact and ecosystem destruction during initial stages do not cause a decrease but an increase of biodiversity. Thus we consider as an indicator of high native biodiversity of little disturbed ecosystems not only the total number of species, but primarily the presence on the territory of a few rare species, occupying very different niches at different trophic levels (Sobolev, 1992). There are biotopically limited rare species (Soderstrom and Jonsson, 1992) that are of primary importance as indicators of nativeness of biodiversity in particular ecosystems. This approach to reveal important natural areas is based on the concept of native biodiversity (Hansen *et al.*, 1991), ecological ordination (Ramensky *et al.*, 1956; Shvarts and Sheftel, 1990) and the combinative system of ecological niches (Shvarts and Zamolodchikov, 1991; Shvarts *et al.*, 1992). The criterion of presence of diverse rare species is especially useful when there is a lack of time for decision making.

Rare species of plants and non-mobile animals are indicators of good integrity of particular spots within a community. The presence of viable populations of rare insects with larva and adult stages inhabiting different microstations points to a community structure close to natural. The occurrence of vulnerable species testifies to a low rate of recent human impact. In forest ecosystems, especially in hardwood forests, the presence of individuals of all age groups in populations of dominating tree species is of great significance (Smirnova *et al.*, 1988). When evaluating a particular natural area, its authenticity should also be taken into account and this means defining not only the presence of rare species, but also the absence of alien plants and animals which is indicative of high rates of disturbance.

Frequently, for the organization of PNAs, areas are proposed which have been slightly transformed yet preserve more or less the natural processes of the ecosystem (e.g. worked-out peatfields). In such cases the persistence of rare species shows a low level of

recent human impact. Another criterion for organizing PNAs on slightly transformed territories is the presence of vegetation that is sufficient for effective self-restoration of the ecosystem.

The presence of a very rare species can provide a basis for specific PNA creation even in an artificial environment, e.g. fishery (rybkhoz) ponds that provide feeding sites for white-tailed eagles (*Haliaëtus albicilla*) or ospreys (*Pandion haliaëtus*).

There are several methods for revealing natural areas meriting special protection. The most common are field surveys, often combined with preliminary analysis of research and other data from the scientific literature, forest and land use planning records, and local questionnaires (Spiridonov and Zubakin, 1983). In some cases specific techniques can be applied, e.g. decoying of owls using tape records of their cries, searching for lines of bubbles in new ice over paths of desman (*Desmana mochata*), and so on.

On numerous occasions an important reason for creating PNAs has been the controlling role of the ecosystem over the environment, e.g. storage of soil water, river protection. In some cases Zakazniks and especially Natural Monuments are being created to protect a scenic place or an interesting natural phenomenon, independently of the quality of the local environment; and sometimes the creation of a Zakaznik or Natural Monument is aimed only at pragmatic goals (game protection, preservation of mushrooms and berries, recreational purposes).

Configuration of the territory and creation of local PNA networks

The area and configuration of PNAs is determined in order to comprise the whole ecosystem, elements of which have to be protected. The borders of PNAs should not be drawn along watersheds, but some distance from the limits of the neighbouring river basin, in order to comprise watershed ecosystems (e.g. bogs). Usually the areas of PNAs range from 1 to 100 000 ha, and sometimes even up to 10 000 000 ha. Such areas might correspond to those of river basins of third – seventh order (small to medium). Most PNAs are scattered in a mosaic landscape in which little-disturbed territories alternate with transformed sites that do not have independent conservation value, but yet sometimes are included as buffer zones for the PNAs. A region's PNAs should be situated so that they efficiently support natural processes of vegetation fluctuations, successions, bird and mammal migrations, and other ecological processes that are typical for the whole region. In the case of mobile animals such as birds, mammals and insects their crucial habitats (biotopes whose destruction can provoke rapid species' decline, e.g. nesting areas, migration routes, places for moulting) can be protected within a group of relatively small PNAs (Wilcox, 1980; Opdam, 1991) as Zakazniks and Natural Monuments (Sobolev, 1988a).

When creating PNA networks attention is also paid to those regions lacking PNAs or territories where previously established PNAs have fallen into an unsatisfactory state. In the latter circumstances the regional network of PNAs should be strengthened such that Zakazniks and Natural Monuments can provide connections between the larger PNAs like Zapovedniks in order, for example, to facilitate migration of mammals.

The specific goal of creating PNA networks in early developed regions is the conservation of landscape structure defined by B.B. Rodoman (1974) as 'polarized landscape': the largest natural and semi-natural complexes are situated in the zones of 'economical emptiness' on the borders between administrative units.

Brief descriptions of the principal types of Protected Natural Areas

Four major types of PNAs are defined by the Russian Federation Law on Natural Environment Protection (Zakon ob okhrane okruzhayushchei prirodnoi sredy):

- State Nature Reserves (Zapovedniks);
- National Natural Parks;
- State Nature Refuges (Zakazniks);
- Natural Monuments

State Nature Reserves (Zapovedniks)

Zapovedniks are both nature protective and scientific research institutions. Thus the term 'zapovednik' has two senses: a type of protected area that falls in UN category I (IUCN, 1990); and a juridical person or institution being a land user of the protected area.

The Zapovedniks are intended to meet the following objectives: conservation of biodiversity and protected natural complexes; ecological monitoring; scientific research in natural ecosystems: environmental and conservation training of professionals; environmental education of the general public; and provision of ecological expertise in regional development projects. The first three tasks are being performed more successfully than the last three. The main function of Zapovedniks in the whole system of PNAs is the protection of the most valuable natural complexes. As of 1 January 1994 there were 89 Zapovedniks in Russia, 16 of which are designed as biosphere reserves. The total area of Russian Zapovedniks is equal to 292 768 km^2 (approximately 1.44% of the area of Russia).

National Natural Parks (NNP)

As in the case of Zapovedniks the term National Natural Park has two senses: a protected area that falls in UN category II (IUCN, 1990) and a juridical person using the area for designated purposes.

The NNPs are intended to meet the following objectives: protection of natural complexes and objects of cultural heritage connected with them; maintaining public access to undeveloped or partly developed land for hiking, camping, skiing, and other recreational pursuits, where appropriate; environmental education; elaboration and introduction of scientifically-based approaches to the protection of natural and cultural heritage.

In Russia's PNA system, the NNPs play an important protective role for comparatively large tracts of land having been used traditionally for recreation, that cannot or need not be prohibited. As of 1 January 1994 there were 25 NNPs in Russia with a total area of 64 437 km^2 approximately 0.38% of the area of Russia.

State Nature Refuges (Zakazniks)

Zakazniks are areas where the use of natural resources is partly restricted in order to preserve natural complexes or particular objects. Zakazniks fall in UN category IV – Nature Conservation Reserves or Wildlife Sanctuaries (IUCN, 1990). Instead of Zapovedniks or National Parks there is no special institution (juridical person) managing the Zakaznik. Establishment of a Zakaznik does not require land withdrawal from land users.

According to the Standard Regulations Zakazniks are intended to meet the following

objectives: conservation of natural complexes; conservation, regeneration and restoration of natural resources; and maintaining ecological balance.

The function of Zakazniks in the system of Russia's PNAs is protecting most wildlands and other valuable natural areas, although these are usually not so important as the territories of Zapovedniks and NNPs. Zakazniks constitute the major portion of all PNAs in the earliest developed regions, besides which since the establishment of a Zakaznik is relatively simple, is quite often the best compromise in cases where a Zapovednik or a National Park cannot be organized. As of 1993 there were 1519 Zakazniks in Russia with a total area of more than 800 000 km^2 (approximately 4% of the area of Russia).

Natural Monuments

Natural Monuments are considered as PNAs of UN category III (IUCN, 1990), but at the present time they more closely correspond to category IV. As in the case of Zakazniks no special institution (juridical person) manages Natural Monuments. Land allocation can be permitted only in exceptional cases but to date this has never occurred. Natural Monuments are protected by the land user, or after agreement by other individuals or organizations.

Natural Monuments protect interesting natural objects and several thousand have been declared in Russia. However, there is no agency that collects data on Natural Monuments so that neither an exact number nor the total area of these natural objects is known.

Natural Monuments often play the role of Zakazniks, because local authorities in many places are much better acquainted with the term 'Natural Monument' rather than Zakaznik. Therefore, many areas, being *de facto* Zakazniks, bear the name of Natural Monuments.

Other Protected Natural Areas

In addition to the 4 types of NPA mentioned, there are a few that are defined by the Russian Federation's Bases of Forest Legislation. In Forest Reserves all felling activities including not only clear-cutting, but selective and sanitation cutting are prohibited. In 'Protected Area Forests' (especially Valuable Forest Tracts, Forests of Scientific or Historical Importance, Natural Monuments, Nut-tree Forests, Fruit-tree Forests, Near-tundra Forests) the prohibition refers only to clear-cutting. Finally in Forest Preserves, felling activities should be restricted, but not obligatorily prohibited. According to the instruction regulating their destination there are more than 20 different categories of such forests, e.g. 1 km zones around capercaillie mating ground (*Tetrao urogallus*) zones, along hiking trails.

The decree of the President of the Russian Federation (N 67-rp of 21 February 1992) has designated 'State complex "Zavidovo" with the status of national park' and having an area of 1254 km^2.

The decree of the President of the Russian Federation (N 309 of 27 March 1992 and RF Government Enactment N 462 of 6 July 1992) has designated a specially protected ecological resort region 'Kavkazskie Mineral'nyi Vody' (Caucasian spa). This PNA corresponds to the UN category VIII according to IUCN classification.

The Enactment by the Council of Ministers of the RSFSR N 91 from 17 March 1989, confirmed the Regulation on Water Protection Zones (Belts) along rivers, lakes and storage reservoirs. Water protection zones not only promote reservoir preservation, but also are considered 'prospective environmental corridors', providing ecological

connections between PNAs, and therefore should play a prominent role in biodiversity conservation.

Sometimes local authorities make decisions on the establishment of local natural parks, e.g. Kandalaksha Natural Park was created by the local Kandalaksha district Soviet and natural ethnic park 'Berengiya' – by the administration of Chukchi autonomous district. Unfortunately such decisions have no legislative justification.

Legislation regulating the establishment and management of PNAs

Legal foundation for an application to establish a PNA

The Russian Federation 'Law on Natural Environment Protection' specifies the protection of fauna and flora, and primarily those threatened species included in National Red Data Book; while the legal basis for establishing PNAs is provided by the law of RSFSR 'on the protection and use of animals' and the RF Bases of Forest Legislation.

The Decree of the Council of Ministers of the RSFSR (08.09.76 N 501) 'on measures for improving the protection of wild animals and plants which are threatened by the extinction' includes the possibility of establishment, if necessary, of Zapovedniks and Zakazniks for the protection of habitats of animal and plant species, protected in terms of the CITES convention. References to species listed in Russian or IUCN Red Data Books and regional records of rare and protected species are also used as arguments in favour of establishing Zakazniks and Natural Monuments.

The Decree of the Supreme Soviet of the RSFSR (25.12.90 N 447-1) 'on urgent measures for the conservation of national cultural and natural heritage' prohibits the sale, leasing and other uses of lands and natural resources of state Zapovedniks; requires the termination of land diversion, construction, road-building, mining and other nature transforming activities within protected and projected natural and historical cultural territories, as well as their protective zones. The latter is especially important because it allows authorities to insist that development of valuable natural territory to stop immediately even if the decision on its protection has not yet been passed.

Main principles and mechanism for the establishment of PNAs

There are four main levels of natural resource management in the Russian Federation: (i) federal, (ii) regional (RF subjects), (iii) local authorities, and (iv) landowners, land users and land tenants (collectively land users). The process of decision-making at each level is preceded by the consent of the appropriate authorities at all lower levels and of land users. Authorities at lower levels and land users in their turn make decisions and actions according to the federal legislative acts and other subordinated acts. According to the Land Code of RSFSR, all changes in land use regulations should be negotiated with land users and with appropriate local (district, village, town or city) authorities for mutual agreement.

The key procedure necessary for the creation of PNAs is 'soglasovanie' i.e. negotiations with interested parties in order to gain their consent. It implies that the interested party pledges to fulfil the requirements of the PNA regime (or if necessary consent to land allocation for the PNA). The simplest way of achieving this is the signing of the appropriate document by the organizations' responsible leaders. Usually regional (or local) authorities make a special decision confirming their consent to PNA establishment.

After successful negotiations at local (district or municipal) level, all project materials are handed over to the regional (RF subject) level. In practice decision-making requires coordination with a great number of State agencies regulating the use of natural resources and territory development at the regional level, i.e. Main Architecture Planning Department, Land Reform Committee, Department of Agriculture, Forestry Department, Game Management Department, Sanitary and Epidemiology Service. At the same time the additional agreement needs to be obtained of interested industrial enterprises monopolizing work of a particular kind in the region; or with public associations, managing nature resources in the region (e.g. regional game and fish groups); or the regional council of the All-Russia Society for Nature Protection. When the agreement of all interested parties has been negotiated RF subject authorities establish the regional PNA.

Establishment of major types of PNAs

Regulations for the establishment of the four major types of PNA in the Russian Federation are determined in the RF 'Law on Natural Environment Protection' (Zakon ob okhrane okruzhayushchei prirodnoi sredy) and the RF Government Enactment N 613 of 21 August 1992 'On the changes in and recognition as invalid of the previous enactments of the RF Government because of the passing of the RF Law on Natural Environment Protection'.

In accordance with the above instruments, Zapovedniks and National Parks are being established by the Governments of the Russian Federation or by member Republics of the RF. The same regulations for the establishment of Zapovedniks are described in the current version of the 'Regulations on State Nature Reserves (Zapovedniks) of the RF', adopted by RF Government Enactment N 48 of 18 December 1991, with changes according to the above mentioned Enactment N 613.

Similarly in accordance with the RF 'Law on Natural Environment Protection' and Standard Regulations on State nature refuges (Zakazniks) (RF N 33 of 14 December 1992) federally administered Zakazniks are being established. The particular goals and objectives of Zakazniks together with description of their territories are specified in individual regulations ('Polozhenie o zakaznike' – see Appendix). A map drawn to scale not less than 1:100 000 is an obligatory accompaniment of the description of the Zakaznik; for a territory describing agricultural enterprises, a scale of 1:10 000 is adopted in accordance with requirements of the land planning service. Such maps are prepared during negotiations for the PNA.

According to the RF 'Law on Natural Environment Protection' and Standard Regulations on Natural Monuments (RF N 33 of 14 December 1992) federally administered Natural Monuments are declared by the RF Government after presentation by Minpriroda and by consent of RF subject agencies. Regional Natural Monuments are declared by the decisions of RF subject agencies after presentation by regional subdivisions of Minpriroda. The RF 'Law on Local Government' prescribes that district ('rayon') authorities can also declare local natural objects as Natural Monuments and define regulations for their protection and management.

For Natural Monuments the document describing their functions and regulations is the Natural Monument passport ('Passport pamyatnika prirody'). It contains: the name of the Natural Monument; its importance and role for nature protection; its exact location; a brief

description of the Natural Monument; a description of its borders, and separately, if any, its buffer zone; and the names and juridical addresses of Natural Monument land users, and the name and address of the organization or individual, committed to protect the Natural Monument.

Responsibility

The organization of nature protection in Russia is in general laid on Minpriroda (the Ministry of Environmental Protection and Natural Resources). Seventy-eight Zapovedniks are managed by Minpriroda, directly by the Main Department of Nature Reserves Management; 6 Zapovedniks are managed by the Russian Academy of Sciences; 1 belongs to the State university and 1 to the Federal Forestry Service. Twenty-two NNPs are managed by the Federal Forestry Service and its regional departments and 3 NNPs are managed by district administrations or their forest services.

The responsibility for protection of the Zakazniks and Natural Monuments of Russia as a rule is placed on the land users, that is conditioned by the history of the development of these types of PNAs in Russia.

Zakazniks have been created traditionally first of all for game protection. Thus, 64 federal Zakazniks are protected by the Department of Hunting and Game Management (Glavokhota) of the RF Ministry of Agriculture. Seven federally administered Zakazniks are under the jurisdiction of State nature reserves (Zapovedniks) and serve as diversity proving grounds.

Most PNAs (National Parks and most of the Zakazniks and Natural Monuments) are managed by institutions other than Minpriroda. Minpriroda actually does not manage, but monitors and controls the actions of landowners and land users in order to uphold RF laws and regulations. Land users usually are not interested in preserving Zakazniks and Natural Monuments. Moreover they very rarely have supplementary funds for such protection. Therefore, there are no permanent staff for guarding Zakazniks and Natural Monuments (except some game Zakazniks). Practically all the control over the state of protected objects in Zakazniks and Natural Monuments as a rule is carried out by public media, in more or less successful contact with Minpriroda and land users. From the natural protection point of view, the most essential fact is that establishment of the Zakazniks and Natural Monuments provides the legal basis for restricting development of those areas. The maintenance of these restrictions and the data on the borders and state of Zakazniks and Natural Monuments listed in the official documentation of various institutes and organizations, is far more important than actual physical protection.

The Network of Protected Natural Areas

Description of the Moscow Region

The Moscow Region is one of the most economically developed and populated regions in Russia and has one of the most developed regional networks of PNAs in Russia. The size of the Moscow Region is 47 000 km^2 and its population is 17 million. The Moscow Region is situated on the southern edge of forest zone and its southern part extends to the forest-steppe zone. The territory of Moscow Region is divided into 6 physical-geographic provinces, which in turn are subdivided into 17 physical-geographic districts. These physical-geographic provinces correspond roughly to geobotanic and soil districts.

History of PNA creation in the Moscow Region

The first PNAs established in 1923–1933 were aimed at conservation of particular natural sights (3) or game fauna (1). Establishment of the Moscow Zapovednik in 1945 which consisted of 5 units was an attempt to preserve the model natural areas of the region, but in 1951 4 out of 5 units were eliminated. During the following 20 years 21 PNAs have been established, including 9 for the protection of less altered natural territories, 6 for the preservation of historical and cultural objects and 6 for the protection of game fauna. Since 1972, a systematic investigation of the region has been made in order to form a representative network of Zakazniks.

During the last 10–15 years in the Moscow Region, and some other early developed territories, the fifth stage of urbanization (Gibbs, 1963; Hall and Hay, 1980) i.e. de-urbanization and even the redistribution of population has begun. This activity may destroy the last sanctuaries of native biodiversity between dense populated territories (Shvarts *et al.*, 1990; Sobolev *et al.*, 1990; Zubakin, 1990). For this reason since the beginning of the 1980s an additional, special legal protection of large natural objects has appeared, primarily in response to the development of drainage and then building of country cottages on a mass scale.

Therefore, the goals for establishing PNAs have gradually changed from the former 3 (conservation of model objects, sights and resources) through the following 4 in the 1970s (the former three plus conservation of biodiversity), to the most recent 5 in the 1980s and 1990s (the former four plus conservation of landscape structure).

State of the network of PNAs in the Moscow Region

By 1 January 1994 the following reserves comprised the network of PNAs in Moscow Region: Prioksko-Terrasniy Zapovednik (4945 ha, Prioksky physical-geographic district); National Nature Park Losiniy Ostrov (11 000 ha, physical-geographic district of the Near-Moscow plain); all other physical-geographic districts (total area 1 935 000 ha): 167 Zakazniks (160 regular and 7 game Zakazniks); 78 Natural Monuments (60 natural objects and 18 objects of garden art, history and culture); and 55 forest reserves. Making allowance for some overlap of PNAs there are in all 295 units in the Moscow Region PNA network. The distribution of PNAs according to their size is shown in Fig. 1. The total area of PNAs is about 4.4% of the whole Moscow Region. Information about the restricted use of nature resources in the PNA territories of the Moscow Region is presented in Table 1.

Data on violations of protected areas are listed in Table 2. The establishment of Zakazniks and Natural Monuments without permanent guards does not influence the recreational use of the territory and while violations caused by industrial activities are registered rarely, their number has also grown more recently. In one case, Mosoblispolkom (the administration of the Moscow Region) cancelled the prohibition for carrying out drainage on part of a Zakaznik. On the other hand, in the period of dramatic growth in collective horticulture in 1987–1990 Mosoblispolkom erroneously made decisions on three occasions to allocate collective gardens on Zakaznik territory. Later all these decisions were cancelled. In 7 out of 8 other cases, decisions on land leasing for collective gardens were cancelled after Zakazniks were established on those territories. In 15 out of 36 cases where important natural areas were not listed as Zakazniks or Natural Monuments, protesting against their development was unsuccessful.

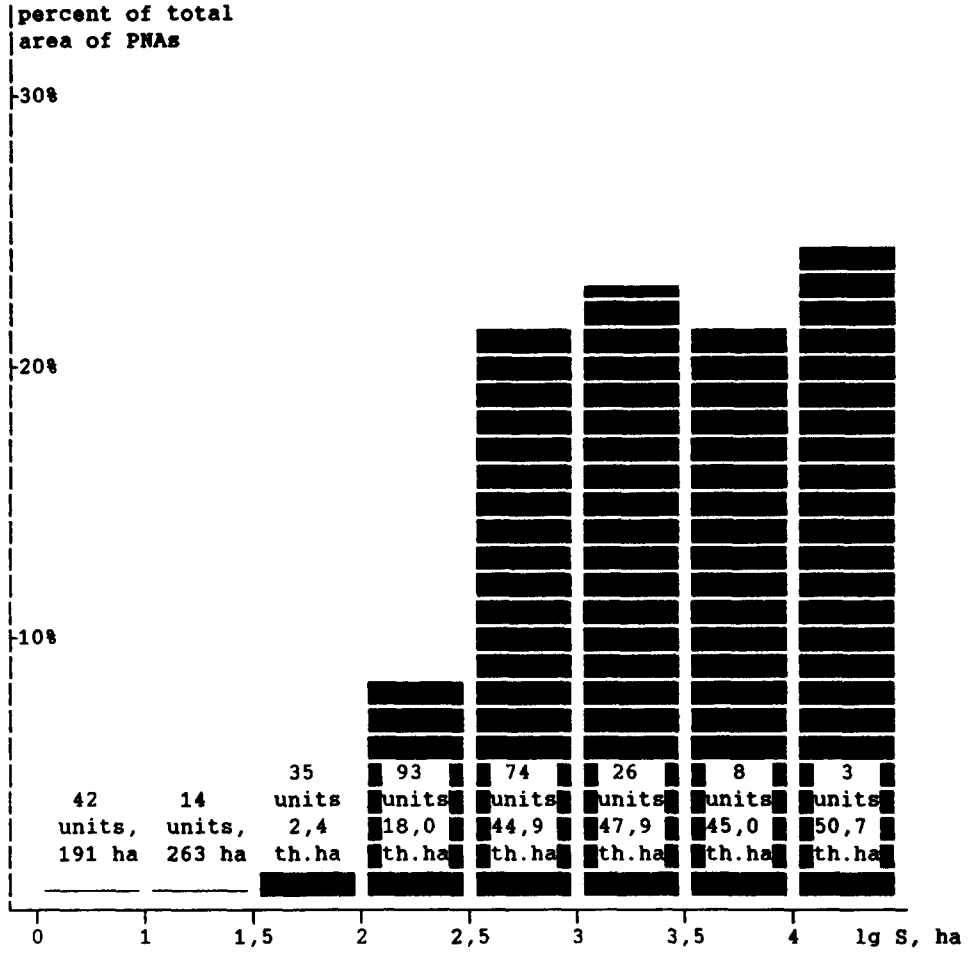

Figure 1. Size distribution of PNAs in the Moscow Region.

The role of PNAs in biodiversity conservation in the Moscow Region

In the most developed regions of the country the effect of habitat destruction in threatening biodiversity is very prominent. About 70% of all threatened terrestrial vertebrate species in the Moscow Region declined due to habitat destruction (Fig. 2). Similar results have been obtained when populations of rare invertebrates and plants have been analysed. The establishment of Zakazniks and Natural Monuments has promoted considerable conservation of biodiversity in the Moscow Region (Table 3). Thus, 148 out of 245 protected species within the Moscow Region are registered on PNAs. Habitats of most other protected species are now identified and appropriate PNA projects are being transferred to the Moscow Region department of Minpriroda. Different forest ecosystems are protected in 233 units of 1 469 000 ha; sphagnum and moss bogs in 65 units (92 000 ha); back bogs in 42 units (13 700 ha); wet meadows in 22 units (39 000 ha); dry and steppe meadows in 17 units (770 ha) and more than 50 lakes with a total area of 49 000 ha in 40

Table 1. Adopted and proposed restrictions on the use of natural resources on Zakazniks and Natural Monument territories in different ecosystems within the Moscow Region (proposed figures are shown in brackets)

Type of restriction	Number of PNAs	Number of units	Total area (thousand ha)
Forests			
all felling prohibited	67 (75)*	75 (83)	36.3 (95.3)
all felling except sanitary prohibited	40 (100)	43 (112)	22.7 (58.6)
the same with prohibition of log trailing	13 (13)	20 (20)	3.4 (3.4)
only clear-cutting prohibited	47 (22)	54 (24)	21.2 (8.0)
the same with prohibition of log trailing	29 (12)	34 (14)	30.0 (14.4)
the same with restriction to seasonal felling	36 (14)	38 (15)	40.7 (21.7)
Sphagnum and moss bogs			
drainage works prohibited	63 (64)	63 (64)	9.2 (9.2)
Back bogs			
drainage works prohibited	37 (40)	38 (41)	8.5 (11.7)
Wet meadows			
drainage works prohibited	13 (21)	14 (22)	2.6 (3.9)
grazing prohibited	13 (20)	13 (21)	1.8 (3.9)
hay cutting restricted	4 (19)	4 (19)	0.46 (2.3)
Dry and steppe meadows			
grazing and driving livestock prohibited	13 (14)	17 (18)	0.54 (0.58)
grazing restricted	1 (0)	1 (0)	0.04 (0)
hay cutting restricted	8 (14)	8 (17)	0.20 (0.58)

*including Forest Reserves.

units. Thus the foundations of biodiversity conservation in the Moscow Region are firmly established.

Involvement of non-governmental organizations in the creation and management of Zakazniks and Natural Monuments

An essential, if not the main part of the work in identifying important natural areas, the establishment of Zakazniks and Natural Monuments and their management is done by the public on a voluntary basis (students and scientists from administrative centres, school teachers, game and forest managers in rural areas). Tourist organizations also sometimes take part in revealing important natural areas. The formal registration of public activities used to be made through the All-Russian Society for Nature Conservation which was *de facto* a part of the State system of nature conservation in the former USSR. Staff and officials of some of the Society's regional subdivisions played essential roles in negotiations with land users and other interested parties. Following the creation of Minipriroda many

Table 2. Violations of the use of Zakazniks and Natural Monuments which were registered in 1986–1990 (Moscow Region)

Type of violation	Number of NPAs which experienced violation of protected objects		
	slight	essential	threatening
Felling and other types of forestry activities	7	2	1
Ploughing	1	0	1
Grazing and driving livestock	5	1	3
Draining	3	3	3
Flooding	0	0	2
Lack of control over ungulate numbers	1	2	2
Unauthorised visiting	2	25	4
Collection of berries and mushrooms	8	8	1
Rubbish dumping	8	6	2

leaders of the Society have retained their influence within authorized bodies, especially when the latter are interested in working with NGOs.

Nature Protection Corps (Druzhiny po ochrane prirody; DOP) consisting of students

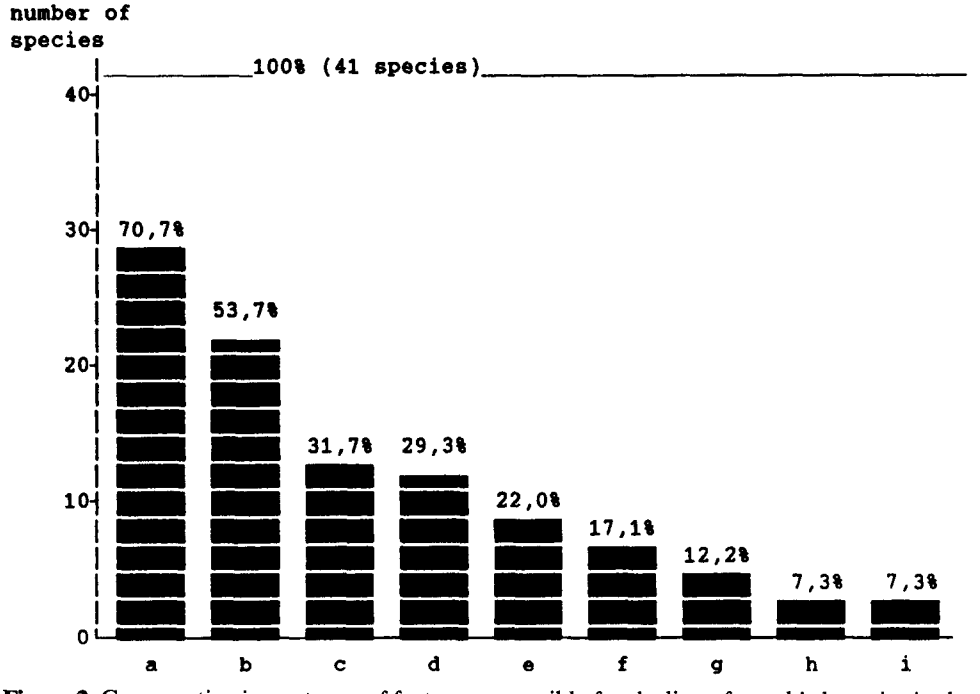

Figure 2. Comparative importance of factors responsible for decline of rare bird species in the Moscow Region (from Zubakin, 1990). a – Habitat destruction; b – Disturbance; c – Direct elimination as pests in agriculture, game and fish management; d – Overtrade; e – Death caused by agricultural activities; f – Destruction of forage base; g – Environment pollution; h – Impact of introduced species; i – Miscellaneous losses.

Table 3. Protected species in the Zakazniks and Natural Monuments of the Moscow Region. sat: satisfactory – the object does not experience a suppressing impact and any arising in the near future is unlikely providing conservation of the existing structure is maintained. unst: unstable – the object does not experience a suppressing impact now, but its existence will be threatened if such impact emerges in the near future. unsat: unsatisfactory – the existence of the object is threatened in coming years.

Taxa	Number of protected species	Protected object in PNAs	Number of species listed in PNAs as protected objects	State of protected objects		
				sat	unst	unsat
Mushrooms and lichens	6	population	4	4	—	—
Vascular-spore plants	8	population	6	4	2	—
Angiosperms	99	population	78	73	3	2
Insects	36	population	8	4	4	—
Fish	1	—	—	—	—	—
Reptiles	3	population	3	3	—	—
Birds	71	population	20	19	1	—
		critical habitat	17	16	1	—
		habitat	3	3	—	—
Mammals	21	population	7	7	—	—
		habitat	2	2	—	—

and young researchers and organized by specialists, is the best organized of the NGOs (Shvarts and Prochorova, 1993; Yanitsky, 1993). For example, in the Moscow Region the project documentation for more than half of the Zakazniks and Natural Monuments was developed by DOP members, and many others were developed by professionals who obtained their experience in the DOP. The DOPs usually provide training for new members and regular meetings of DOPs from the former USSR are being held to provide exchange of experiences. Guides have been published for the establishment and control of the state of Zakazniks and Natural Monuments. The programme 'Fauna' (Zubakin, 1983) has been formulated and designed for DOPs as an exemplary plan for their activities in conserving biodiversity. Several DOP members after graduation from universities become professionally connected with nature protection, working in Minpriroda divisions or inspecting services. Former DOP members have founded the Socio-Ecological Union, which now provides the methodological and legal assistance for DOPs.

Finally some NGOs (Ecocenter 'Dront', Laboratory of Ecological Planning, Laboratory of Applied Ecology, etc) not only work voluntarily, but also to the order of Minpriroda, local authorities, or nature resource users.

Capabilities and Problems of the PNA Network

The creation of Zakazniks and Natural Monuments has helped to produce the best compromise between nature protection and the use of natural resources in the vast

territories within Russia. In regions of population density the lack of guards is compensated in part by the activities of NGOs (Volodin and Sobolev, 1982). Thus against all odds and due to the great number of Zakazniks and Natural Monuments, Russia has the type of PNAs that permits the protection of biodiversity in natural and in developed regions.

However the dramatic and all-encompassing changes that are taking place today in Russia have seriously influenced the whole system of PNAs, and particularly Zakazniks and Natural Monuments. The major problems are: increase in the number of people exploiting natural resources; drastic changes in legislation, especially in land ownership, with imperfections and lack of harmony between different laws and regulations; decentralizing tendencies and weakening of State governmental control at all levels; financial constraints of many NGOs and lending specialists. Expansion of business activities is precipitating a fifth stage of urbanization in the well-developed regions thus threatening zones of 'economical emptiness' with intensification of nature resource use, rapid increase of population density, and the siting of factories and waste dumps. The most inevitable damage arises from the breaking of new highways and railways through the largest nature tracts on the borders of administration units. Thus the new Moscow–St Petersburg railway menaces the State complex 'Zavidovo' and the National Park 'Valdaisky' areas situated on the borders of Tver Region with the Moscow and Novgorod Regions, respectively.

It has been remarked previously that the weak point of Zakazniks and Natural Monuments is their lack of guards (Sobolev, 1988b). Formerly the losses from illicit private activities were not excessive but currently their impact has increased dramatically and can be seen in increased poaching, collection of berries, mushrooms, and medicine herbs and damage from recreation activities. Several cases of unauthorized land cultivation have also been registered. Territorial subdivisions of Minpriroda have neither the staff for protecting Zakazniks and Natural Monuments nor the funds for their employment. Moreover, legislation does not set any penalties for most types of violation of the PNAs. The establishment of PNAs is possible only if the land user agrees with the proposal. However, state forestry managers can give their consent only if the restriction of felling was previously stipulated by a forest management plan. Therefore, some Zakazniks and Natural Monuments have not been established or were established on smaller areas with weakened protective status, than those proposed. In addition, changes in land ownership usually include changing the juridical person who manages the PNA. In this situation one can expect actions that lead to the closure of the PNA or weakening its regulations.

Decisions on land leasing for various individual authorities are being passed at the level of district authorities, while the main control over Zakazniks and Natural Monuments is concentrated at a higher administrative level. As a result a situation can arise when an appropriate subdivision of Minpriroda can be unaware of an illegal decision at the district level leading to development on the PNA.

Forest legislation is not coordinated with land or nature protection legislation. According to the RF Bases of Forest Legislation, all the forests of Zapovedniks and other specially protected areas are part of the Forest Fund. However, under the Land Codex the lands of PNAs are categorized as Lands for Natural Protective Purposes and Lands of Natural Reserved Fund, but not as lands of the Forest Fund. According to the Provisional instructions for logging in the forests of European RSFSR, where only sanitation cutting (for forest plantations) and improvement cutting are allowed (adopted by Goskomles of

USSR 19.05.89 and active in Russia) the term 'improvement cutting' has been extended to selective felling for commercial use or to gradual and search felling.

Possible ways of preserving and developing PNA networks

The legal basis for the creation and management of PNAs

We can suggest that the following measures should be undertaken: transferring all protection functions in the PNAs to Minpriroda; arrangement according to legal standards of incongruous articles of different legal documents; development of a legal basis for the adjustment of natural resource management plans, considering especially valuable natural areas (e.g. compiling a State List of such areas); prohibiting the privatization of PNAs and preventing newly revealed important natural areas being used for agricultural and other purposes; exclusion territories, important for biodiversity conservation, from the district land allocation fund to prevent their leasing for private purposes.

In our opinion, Russia needs a wider range of PNAs:

- PNAs of category VIII (IUCN, 1990) – Multiple Use Managed Areas. PNAs of this category are better established in traditionally developed regions for stabilizing landscape structures.
- PNAs of category VI (IUCN, 1990) – Anthropological Reserves. These reserves are needed in the areas where development threatens the survival of indigenous people.
- Natural parks of regional significance. This category is a priority in regions with high population density and should be applied in cases where the regulation of the impact of recreation on natural territories is necessary.
- Wetlands of international importance especially for waterfowl habitats. These territories being established under the terms of the Ramsar Convention should be legalized in full in Russia, with the adoption of rules of management and a new State List.
- Strict Reserves, in which territory is completely withdrawn from any use similar to existing Zapovedniks but without scientific research staff. This category should be applied in the cases of loss of means to create Zapovedniks.
- PNAs of category V (IUCN, 1990) – Protected Landscape or Seascapes. These territories are desirable for conservation of areas of high amenities and for their natural beauty.

Actions for established and rapidly developing regions

In order to stabilize the ecology of established and rapidly developing regions and to protect their biological diversity, an integrated system of PNAs needs to be created (mostly Zakazniks and Natural Monuments). The greater the anthropogenic pressure upon nature, the larger must be the PNA network (Reimers and Shtilmark, 1978). Priority should be given to regions that lack a developed PNA network, e.g. the centre of European Russia, Northern Caucasus, Ural, Primorye) or in the areas now being intensively developed (Western part of Arctic Russia, Western Siberia, vicinity of the Baikal–Amur railway).

In order to perform such a task, the reorganization of most forestries (leskhozy) into recreation and conservation oriented enterprises with large protected zones should be made. The methods of providing economic incentives for landowners to reduce land under

agriculture and to restore natural vegetation as developed and applied, for example in the USA in 1980s (Brown, 1987) are of great interest as is the Swedish forest and nature protection legislation because the latter probably can be more easily implemented in Russia.

In order to stabilize landscape structure certain lands under the jurisdiction of the State Land Reserve (Goszemzapas), formerly belonging to kolkhozes[1] and sovkhozes,[2] but not suitable for agricultural purposes, should be transferred to subdivisions of Minpriroda. In the forest zone, such territories usually would be bogs and young secondary forests. For example, leasing of such Goszemzapas land to Minpriroda is needed currently for the establishment of the Zakaznik being organized in Franz Joseph Land.

Relations with local people and support for the NGOs

In many respects the stability of PNAs depends upon the attitude of the local people and for this reason it is necessary to promote their interest in Zakazniks and Natural Monuments. In this context, the following activities are desirable: development and reinforcement of local environmental groups; restoration of naturalist movements based, for example, on regional museums, schools in rural areas; establishment of regional or correspondent groups (rural school teachers, hunters, game managers, etc) who provide information for environmental organizations and specialists; publicizing special environmental issues in local newspapers.

A collaborative project, 'Conservation Training Teams', is to be initiated by The Nature Conservancy and Biodiversity Conservation Center to provide general experience for local NGOs in the establishment and protection of PNAs and to support their activities. The Biodiversity Conservation Center Programme 'Greater Podmoskowie' which began in 1994 is devoted to problems of biodiversity conservation in the Moscow Region and neighbouring territories and involving local people in its activities.

Ultimately the necessary condition for successfully creating and managing PNA networks is the close collaboration between NGOs, Minpriroda and its subdivisions and authorities at all levels.

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[1]Kolkhoz: a collective farm or agricultural enterprise.
[2]Sovkhoz: a State farm or agricultural enterprise.

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Appendix. Regulations governing Zakaznik ('Polozhenie o zakaznike')

The Zakaznik is established by the decision of Mosoblispolkom (10.12.86 No 1498/41 and expanded 24.12.87 No 1699/38).

Name of Zakaznik and its characteristic Cherusti Forest. Complex.

Location Moscow Region, Shatur district, to the South of Cherusti settlement.

Land users Shatur forest industry (Cherusti and Telma forestries), sovkhoz 'Pyshlitzkiy'.

Legislation, on which basis the Zakaznik has been established Article 9b of the Law of RSFSR 'About the nature protection in RSFSR', 1960, Article 25 of the Law of USSR 'About the protection and use of animals', 1980.

Other acts, concerning the Zakaznik territory None exist.

Square area and description of borders About 21 700 ha. The border going from the East to the West goes by the northern border of compartments No 1, 3, 123 of Cherusti forestry. The Western border of the Zakaznik coincides with the border of lands belonging to the State Forest Fund and goes from the North to the South from compartment No 123 to compartment No 69 of Cherusti forestry. From the Western end of a cutting ride between compartments No 69 and 82, the border goes through the lands belonging to the State land reserve along the ditch, skirting the peat fields from the East and reaches the cross of the ditch and channel No 42. Then the border follows 1.5 km to the West up to fire ditch No 13 and to the South up to the channel No 45. The border then goes along the channel No 45 up to compartment No 116 of Cherusti forestry, and along the border of Cherusti and then Telma forestries up to the southern corner in the Northern part of Telma forestry. From the southern corner in the Northern part of Telma forestry (compartment No 42) the border goes to the South-East (1.6 km) up to the stream, flowing to the East. Then the border goes to the East along the stream up to Lake Svyatoye and further to the North by the lake bank to the border of Moscow Region. The border then coincides with the border of Moscow Region to where it crosses the Kazan railway and turns to the West, following the border of Cherusti forestry.

Object importance A) Republic; B) Scientific (zoological, botanic, landscape), game, water protection. The largest area of typical Meshchera forest and wetland ecosystems in the Moscow Region with rich, typical flora and fauna. Habitat of threatened animal and plant species to be protected according to the joint decisions of Mosgorisplokom and Mosoblispolkom including those listed in Red Data Book of the USSR – short-toed eagle (*Circaëtus gallicus*), machaon (*Papilio machaon*), Lady's slipper (*Cypripedium calceolus*). Habitat of some valuable game species. Forests and bottom meadows along the Buzha River and Lake Svyatoye play an important role in the regulation of the level and quality of water in the basin of the Pra River and its tributaries, and also of Lakes Svyatoye, Voymezhnoye, Filinskoye, Telmonskoye.

Historical data on the object The importance of the object was established by field investigations carried out by Druzhina of Biological Faculty of Moscow State University on nature protection and the Young Biologists' Circle of Moscow Zoo (1982–85).

Description of the object Tugolesskiy forest is situated in the Moscow part of Meshchera lowland on the border of Vladimir region. Lake Svyatoye is referred to Klepikovskaya lake system, rivers Buzha and its tributary Tassa are part of the Oka basin. The landscape is typical for Meshchera lowland. The forest consists of oak, lime, high and wet pine forests, alders etc. Small wetlands are scattered over all the area. The banks of the Buzha and Tassa Rivers and Lake Svyatoye constitute wet meadows with birch and pine groves. The meadows in some places are covered with shrubs.

The forest occupies a large area and its essential part is only rarely visited by humans. The object is extremely rich in its animal composition. Endangered species including machaon, short-toed eagle, grey crane (*Grus grus*), honey buzzard (*Pernis apivorus*), grey-headed woodpecker (*Picus canus*) are residents. The fauna complex as a whole is also well represented (birds, mammals, amphibia, reptiles, insects). The wet bank of Lake Svyatoye is a place of overnight stay for cranes (*Grus grus*) before migration (up to 300 birds). Black grouse (*Lyrurus tetrix*) mating sites also occur. Valuable game species include: capercailie (*Tetrao urogallus*), beaver (*Castor fiber*), lynx (*Felis lynx*), badger (*Meles meles*).

Plant species rare in the Moscow Region including Lady's slipper (*Cypripedium calceolus*), *Sempervivum soboliferum* and *Betula humilis* have been found.

State of the object Intensive felling and draining is leading to deterioration of the object.

Necessity of protection Felling and decrease of groundwater (through drainage ditches) is leading to the destruction of habitats of rare animal and plant species. Damaging forest biogenocenosis and the ploughing of floodplains is causing negative impacts on water resources.

Protecting regime

A) Permitted activities:

- sanitation and selective felling (except in specified areas);
- hay cutting at forest openings and floodplains;
- grazing at floodplains;
- regular hunting and fishing;
- collecting berries and mushrooms.

B) Prohibited activities:

- felling except sanitation and selective felling in the State Forest Fund; maintenance felling in specified compartments; clear cutting of forests and shrubs outside the State Forest Fund; felling in the period from 1.03 till 1.09;
- gardening, ploughing;
- any building works, building of roads and other communications;
- draining the territory and restoration of former drainage systems;
- using fertilizers, pesticides, herbicides and other chemicals on all Zakaznik territory;
- vehicle entrance (except vehicles for special purposes);
- camping, making fires.

Ensuring Zakaznik functioning Marking the territory.

Organization which bears the protective functions Shatur forest industry.

Compiler Druzhina for nature protection of Biological Faculty of Moscow State University (compiler-in-chief: Ye.D. Krasnova), 1986; Editor: N.A. Sobolev (1987).