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Conservation and management of animal populations in the Russian forest management system

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The vast forest ecosystems of Russia are very diverse, but poorly managed. Conservation and management of forest animal populations has three main objectives: pest control, preservation of species diversity, and mainentenance of dense game animal populations. Although forest resources should be managed sustainably, the system suffers from lack of coordination between different sectors of administration, low quality of data received from some sources, and poor financial resources.

Introduction

Forest ecosystems in the territory of Russia exhibit unique diversity. Preservation of this gift of nature is the most important goal both for Russia and more generally for the European Community. The need to preserve biological diversity in Russia was first mentioned by V. P. Semenov-Tyanshansky already in the early 20th century. More recently, this goal has been emphasised by some well-known scientists (Fokin 1999, Stepanitsky 1997). The problem has been partially solved by establishing specially protected areas of several categories. At present, there are thousands of such protected areas in Russia. However, in animal conservation it is not enough to preserve some separate typical landscapes only. Long-term conservation of animal populations (both vertebrates and, for instance, arthropods) requires large forest areas. On the other hand, some species considered as forest pests may in the nearest future face extinction. This has already been the fate of *Cerambyx cerdo* L. (Cerambycidae, Coleoptera). Likewise, species with usually low population densities can sometimes demonstrate population outbreaks (for instance, lepidopteran miners).

Although forest animal populations are managed by several Russian ministries and departments, no unified control structure has been established. There are no publications that would have analysed the present administrative situation. Keeping this in mind, the purpose of this study is to analyse the current situation in

the control and conservation of forest animal populations in Russia.

Legal foundation

Forest management of Russia is based on the Forest Code of the Russian Federation, accepted by the State Duma on 22 January 1997. It is the legislatory basis for efficient use, protection and preservation of forests and reforestation in Russia, and for increasing the ecological and resource potential of Russian forests.

Conservation and management of forest animal populations in the Russian Federation has three objectives: (1) pest control as part of forest conservation measures; (2) preservation of species diversity; and (3) maintenance of game animal population densities at the highest possible levels.

Forest pest control is regulated by a number of regulatory documents. In the Forest Code forest pests are mentioned only in articles 93, 99 and 100. Other documents that include regulations on forest pest control are "Regulation on Forest Health Monitoring" (Anon. 1997), "Sanitary Rules for the Forests of the Russian Federation" (Anon. 1992), and "Regulation on the Interregional Forest Health Engineer" (Anon. 1994).

According to the Law of the Russian Federation on Specially Protected Areas (accepted by the State Duma on 1 February 1995) preservation of animal species diversity should be ensured by establishing specially protected areas. The specially protected areas include state natural reserves, national parks, natural parks, state natural game reserves, nature memorials and others. Animal populations can also be taken into account within forest management practices specified for different forest categories. Forests of the Russian Federation are divided into three such categories. Forests of "category 1" are maximally protected against economic activity. This forest group also includes the specially protected areas.

The use of natural resources (in particular animals) in the above mentioned areas is thus regulated, in addition to the Law on Specially Protected Areas, by the Forest Code and the Federal law of the Russian Federation "On the fauna" (1995). The connections between these laws are described in detail by Stepanitsky (1997).

Conservation of biological diversity of forest ecosystems is one of the cornerstones of sustainable forest management in the Russian Federation. Transition towards sustainable forestry in the Russian Federation was approved as a goal in the Decree of the President of the Russian Federation No. 440 of 1 April 1996. In that Decree, sustainable forestry was specifically included in the objectives. In the guideline document of the Forest Federal Service of Russia (FFS) this criterion is presented under #4 and is stated as "Preservation and maintenance of biological diversity of forests and their contribution to the global carbon cycle" (Anon. 1998).

According to the FFS guidelines protection of forest areas depends on the various uses of forest resource lands within Russia. In particular the following criteria are taken into account in decision-making:

— proportion of the total area of the forest resource land that is covered by forests (coniferous, sclerophyllous and deciduous forests);
— proportion of the total area of the forest resource land, covered by different principal forest-forming species;
— proportion of the total area of the forest resource land, covered by forests belonging to different classes and groups determined by age;
— proportion of the total area of the forest resource land covered by mature and overmature forests;
— proportion of the area of specially protected forest land in relation to the total area of the forest resource land (forest reserves, national and nature parks, protected forest lands of scientific and historic importance (nature memorials));
— proportion of the total area of the forest resource land, intended for preservation or maintenance of genetic diversity of forests.

In addition to these, important criteria in-

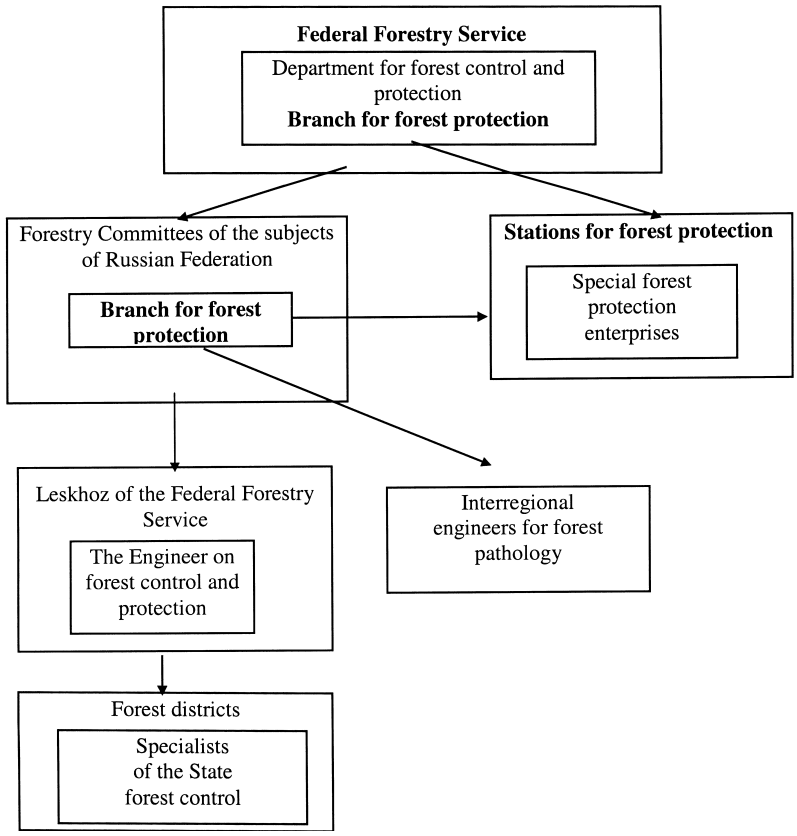

Fig. 1. Organisation of forest protection in Russia

clude the number of threatened plant and animal species that depend on forest ecosystems, and the carbon reserves of the forests. Although species diversity indices are not directly referred to in the guidelines of FFS (in the section "Key elements of criteria in #4", that describes the methods or actions intended for maintaining of the biological diversity), a set of characteristics is given, which have to be based on these indices.

Management of game animal populations is regulated by the law "On the fauna", the Forest Code, as well as by the guidelines set by the Ministry of agriculture and food production of Russia (Minselkhozprod). The purpose of directions, orders and other guideline documents issued by this Ministry is, in general, to maintain the population densities of game animals at a level high enough to allow various kinds of hunting activities.

Forest animal conservation and management system and information flows

Control

The most important Russian organisation that administrates forest management and, therefore, forest pest control is the Federal Forestry Service of Russia (FFS). Its organisation is shown in Fig. 1. Most of the 98 Russian nature reserves are directly managed by the Ministry of environment and natural resource protection of the Russian Federation (Minprirody of Russia, former Goskomekologia). Of the 33 national parks, 31 are under the authority of the Rosleskhoz department. Of the 66 nature reserves of federal significance, 56 are under the authority of the Department for preservation and efficient use of hunting resources, of the Ministry of

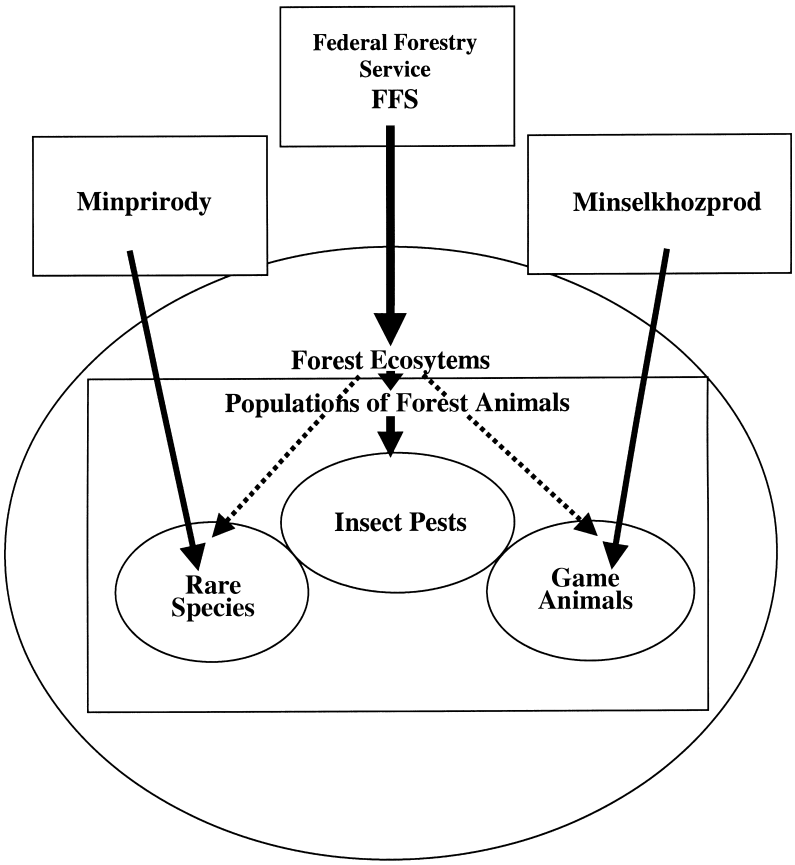

Fig. 2. The organisation of conservation and management of animal populations (Nezhlukto 1994, Stepanitsky 1997, Fokin 1999).

agriculture and food production of the Russian Federation (Minselkhozprod). More than 1600 preserves of regional significance are under the authority and management of territorial bodies of above-mentioned ministries, and the FFS (Stepanitsky 1997). These three ministries are of principal importance in conservation and management of forest animal populations. Departments of these ministries are coordinating their activities with those of local management bodies, that is, with regional governments and local administration.

Hunting management is at present administered by the Department for preservation and efficient use of hunting resources, within the Minselkhozprod. The FFS, in particular its forest protection bodies, also has some hunting control functions (Fig. 2).

Information

Animal species are monitored in the reserves, national parks and other specially protected areas. However, population densities of only certain species are followed. These investigations are performed by specialists working in the reserves, by teams of scientific and research institutes of the Russian Academy of Sciences or, more rarely, by scientists working in universities or institutes within national or international programs.

The collected information is summarised in publications, most commonly in the so-called Red Data Books, in which information is presented separately for different geographical levels (e.g. for the country as a whole, and specifically for different regions and areas). For in-

stance, the most recently published report is the Red Data Book of the Leningrad region (Noskov & Botch 1999). The first volume includes data on sparse woodland landscapes, while the last two volumes will concentrate on plants, fungi and animals. Only individual scientists or groups of specialists working in Rosleskhoz bodies participated in collecting, processing and using of biodiversity data for this report.

The Federal Forestry Service arranged on the whole forest resource land the forest monitoring system as a part of the unified state system of ecological monitoring (USSEM). The forest monitoring system includes forest health monitoring. "1.2 Forest health monitoring (FHM) is a system providing for observation of forest condition, disturbance of their stability, damages inflicted by pests, diseases and other factors. 1.3. Forest health monitoring is an information base for the state control of sanitary condition of forests and disturbances of forest health ... The basic components of the FHM are forest inventory data, a net of permanent control stations and inspection tours ..." (Anon. 1997).

Therefore, the information flows and population control systems for various groups of forest animals are placed under the authorities of entirely different management bodies (Fig. 2).

Efficiency of conservation and control of animal populations

Information

Compliance with preset tasks, reliability and timely acquisition of information are essential prerequisites for efficient decision-making. As shown above, information on forest animal populations is received from three parallel sources (Fig. 2).

The first group of data (1) is produced by scientists of research institutes. These data are mostly published. If the study is carried out by a team of zoologists working within a program, some parts of collected data may be published, while the rest will be included in more informal reports only. The situation is much worse with the other two data sources, i.e. (2) with the data on population densities of pest insects (which in principle should be accurate and updated due to forest health monitoring, and summarised by the FFS), and (3) with the data on population densities of game animals collected by Minselkhozprod. Only some parts of (2) and (3) are reported (Krankina *et al.* 1994). For instance, of the extensive forest health monitoring efforts of 1992 and 1993 only two reports were published (Kulish 1993, 1994). The collected data are (nearly) inaccessible. As a rule, public information sources do not provide any information on what kinds of data on animal species and their population densities exist.

The methods by which data on pest and game animal populations are collected in the appropriate ministries are almost identical. For instance, within the FFS system data on insect outbreaks is collected by specialists working at forest protection stations, leskhozes (forest protection and preservation engineers), interregional engineers for forest pathology (Fig.1), and by other staff of the leskhozes and forest districts. Then these data, summarised in the standard forms on paper, are submitted to the department of forest protection and preservation of the regional forest administration. The regional forest administration then compiles summary reports to be presented to the FFS. They come to VNIITSLESRESOURCE, where the data are processed and compressed into an analytical summary, which is sent directly to the Department for forest protection and preservation of the FFS.

Table 1 summarises data on reported outbreak areas of insect pests (defoliators, bark beetles and wood-boring insects) in certain parts of Russia. For each year and area, the data sent to the FFS from four regions of Russia (Leningrad, Archangelsk and Murmansk regions and the Republic of Komi) are shown in the numerator. For the same year and region, the denominator presents the estimated outbreak area based on other than official sources, mainly published material, various reports, and specialist interviews. A comparison shows that the outbreak areas estimated from these varied sources (de-

nominators) are about four times larger than those declared by official sources (nominators). In addition to species listed in Table 1, we discovered several insect species belonging to these goups of insects, which typically have regular outbreaks, such as *Epirrita autumnata* Bkh., *Hyponomeuta evonymella* Sc., *Eriocrania* spp., *Coleophora laricella* Hb., *C. fuscidinella* Hb., *Phyllonorycter populifoliella* Tr., *P. ulmifoliella* Sirc. (Lepidoptera), *Cilpinia hercyniae* Htg., *Lygaeonematus abietinus* Christ., *L. erichsonii* Hart., *L. wesmaeli* Tischb., *Lyda erythrocephala* L., *L. nemoralis* Toms., *L. hieroglyphica* Crist. (Tenthredinidae) (Selikhovkin 1996, Selikhovkin *et al*. 1998).

Thus, official information by the FFS provides a distorted picture of the actual situation. What are the reasons for such inefficiency of

Table 1. Reported outbreak areas of insect pests in four regions of north-west Russia from 1977 to 1997 (data of FSL/other sources, outbreak areas presented in hectares). *See* text for details.

Year	Leningrad region	Komi republic, Arkhangelskaya and Murmanskaya regions	Total
		***Bupalus piniarius* L. (Geometridae)**	
1981	0/52		0/52
1982	0/221		0/221
1983	3/3025		3/3025
1984	4/0		4/0
1992	233/0	0/67	233/67
1993	2182/2202		2182/2202
1994	2182/2183		2182/2183
		***Diprion pini* L. (Tenthredinidae)**	
1983		200/0	200/0
1984		200/0	200/0
1992		220/0	220/0
1994		0/32	0/32
		***Neodiprion sertifer* Geoffr. (Tenthredinidae)**	
1982	151/151		151/151
1983	3004/3004		3004/3004
1984	215/0		215/0
1989		0/20040	0/20040
1991		6710/32000	6710/32000
1992		5427/12000	5427/12000
1993		5427/6710	5427/6710
1994		0/6710	0/6711
		Bark beetles and wood-boring insects	
1977	17/0		17/0
1979	17/0		17/0
1981	0/120	0/3	0/123
1982	0/10250		0/10250
1983	0/3120		0/3120
1984	0/1000		0/1000
1985	40/5000		40/5000
1986	0/2		0/2
1988	2/0		2/0
1989	10/0		10/0
1990	2/10		2/10
1991	1/5		1/5
1992	0/6		0/6
1993	11/36		11/36
1994	482/488	0/29	482/517
Total	26 740/108 467		

entomological forest health monitoring?

First, enough attention is not being paid to the forest protection service and entomological health monitoring of forests. There are too few specialists, and the service personnel has too many other duties. The need to suppress mass outbreaks of especially the Siberian silk moth (*Dendrolimus superans* Tschetw.) made necessary to organise the forest protection system of Russia effectively. For instance, as a result of massive oubreaks of this species in the 1950s (Rozhkov 1965, Selikhovkin *et al.* 1998) more than 13 million ha of Siberian taiga perished. After this disaster forest protection in the Soviet Union was properly organised and financed for almost 20 years, until the early 1970s. After that, until the next serious outbreak in the early 1990s, investments in forest protection were gradually cut down, the number of forest protection specialists reduced, and forest protection stations mostly closed.

Second, entomological forest health monitoring does not operate properly in most forestry units. Data are submitted to higher authorities only if a large local damage is observed, or if the tree stand in large areas is expected to perish. For instance, a damage to the north-western forests caused by defoliators may be reported only if the relative damage to foliage is 30%–40% and the principal damage area is of the order of tens of hectares. Small damage areas (still more than one ha) may be reported only if they are observed in sparsely forested regions. Regional reports to Rosleskhos compiled by local staff are often based on estimates of damage levels in most damaged areas only.

Third, facts can be twisted because of commercial interests, as will be shown below.

Decision-making

Also the decision-making related to control and management of animal populations is very ineffective. One reason for this is the poor quality of received data, as discussed above. On the other hand, also the poor financial resources of the forest units (leskhozes) decrease efficiency. For this reason all pest control measures that require money (including, for example, the use of biological and chemical preparations, traps, and sterilization methods) can only be applied in some cases.

The most widely used means of pest control and prevention of forest disease spread are sanitary fellings, although the real purpose of such fellings may be quite another. These fellings are nowadays carried out to lower insect population densities also in cases, in which the observed densities are not yet dangerously high for the tree stand. As these fellings are not based on accepted rules, they may not even reduce insect population densities. These sanitary fellings are, in fact, illegal exploitation fellings, performed to bring economic benefit for the forest units. Such fellings are readily done in forest units, in which category 1 forests are prevalent, and legal fellings are restricted. From this viewpoint, increase of forest pest populations can even become economically advantageous for the forest units.

There is a permanent conflict between the interests of forest industries and the necessity to preserve ecosystems populated by rare animal species or game animals. As fellings are carried out, no attention is paid to preservation of capercaillie lekking grounds, or places where berries or mushrooms are abundant.

Moose, wildboar and other ungulates damage young trees, roots, and tree trunks. If their population densities grow too high, they can become very harmful to forest regeneration. As a result forestry workers, whose duty in principle is to protect these animals, turn their interest to control of these animal populations. At the same time, the specialists of the Department for Protection and Efficient Use of Hunting Resources of the Minselkhozprod work for quite the opposite goal — the maximum growth of these populations. This clash of interests exemplifies the lack of coordination between the ministries involved (Martynov 1980, Martynov & Denisov 1990).

Obviously, everywhere and always, inadequate financial means result in poor protection of areas, reduction of special biotechnical measures to a minimum, poor information services, among others.

Therefore, due to scarcity of financial means, lack of coordination between administrative activities, and poor organisation of some manage-

ment bodies it is hardly possible to make optimal decisions and implement them in control and management of animal populations.

Conclusion

Russia has a well-developed system of specially protected areas, hundreds of research groups working in the fields of wildlife conservation and animal protection, lots of experience, and a vast territory with a high diversity of ecosystems. However, the present system does not allow taking the full advantage of these assets.

The main drawbacks of the system in monitoring of animal populations are the following:

1. Lack of coordination of activities, which prevents development of common approaches;
2. Deficient financial means;
3. Lack of information sharing, and low quality of data received from some sources.

Solving these problems of forest ecosystem monitoring should be quite possible, and would be an important step toward sustainable forest management.

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