Bulletin of the *Transilvania* University of Braşov
Series II: Forestry • Wood Industry • Agricultural Food Engineering • Vol. 5 (54) No. 2 - 2012

FUNCTIONAL ZONING OF THE FORESTS INCLUDED IN PROTECTED NATURAL AREAS

F. CARCEA[1] **G. M. TUDORAN[2]**

***Abstract*:** *According to the Romanian forest management strategies, the forests included in natural protected areas are treated as forests having special protection functions, whose management regime is established according to functional criteria as well as functional category types to which the mentioned forests are belonging. It is necessary to adopt these criteria, stated by the current technical norms which enforce the regime of natural protected areas. As a result, there are proposed new functional categories, to lead, for each natural protected area, to a better management.*

Key words: *forest management, natural protected areas, forest functional zoning.*

1. Introduction

Current regulations regarding the forests included in natural protected areas require from the forest management – as the main management instrument for these forests – new tasks. This way, there becomes necessary the improvement of the forests functional framing system in case of forests belonging to natural protected areas, in order to promote, for each natural protected area category, an adequate objective-oriented managing regime.

2. Materials and research methodology

Forest management provides the specific regulations which constitute the premises for forests management measures according to management objectives of the protected areas. For forests included in natural protected areas, it is necessary that the functional system reflects the regulations of norms which enforce the regime of the natural protected areas management. In this context, in order to elaborate the criteria of functional zoning, it was necessary to know the regulations of GEO. no. 57/2007 regarding the regime of natural protected areas, natural habitats and wild flora and fauna conservation. Due the fact that the current forest framing system (functional groups, subgroups and categories) does not cover all the natural protected areas categories according to the current legislation, there is suggested the modification of I.5. subgroup title as well as its content improving as follows:

- title: „Forests of scientific interest and for genetic protection of resources, regulated by current legislation, will be modified as „Forests of scientific

[1] Member of the Romanian Agricultural and Forest Sciences Academy.
[2] *Transilvania* University of Braşov, Department of Forest Engineering, Forest Management and Terrestrial Measurements.

interest and for genetic protection of resources as well as protection of other forest ecosystems containing natural elements of special value ".

- content: improved according to legal regulations.

3. Natural protected areas in Romanian forest management

In Romanian management, natural protected areas are treated as forests having special protection functions, for which the management regime is established by considering the functional categories and types of the stands, and is defined as [1-5]:

– Integral protection regime, applied to the forests included in the 1st functional type;
– Special conservation regime, applied to the forests included in the 2nd functional type;
– Sustainable management regime, applied to the forests included in 3rd and 4th functional types.

The inclusion of forests/forest vegetation in natural protected areas is carried out, mainly, by considering the Romanian framing system (functional groups, subgroups and categories). There are especially considered forests belonging to the 1st group, I.5. subgroup: „Forests of scientific interest, and genetic-ecologic protection of resources, which, according to technical norms for forest management [7], can be included in functional categories and types. There can be remarked that complex natural protected areas, such as national and natural parks as well as biosphere reservations, can include forests from any main category from the other functional subgroups belonging to 1st group – Forests with special protection functions; the last ones are superposed in all cases with one of the following functional categories: 1.5.l, 1.5.m or 1.5.n.

4. Supplementary appreciations regarding the management of forests included in natural protected areas

4.1. Proposals regarding the modification of I.5. functional subgroup and revision of component functional categories

As mentioned above, the constitution of natural protected areas generally considers the forest from I.5. functional subgroup. In the following there are suggested both modification of title for this subgroup as well as revision of component functional categories in order to cover all the natural protected areas which are mentioned by current law. In this order of ideas, there is proposed the modification of the respective title to: I.5. subgroup „Forests of scientific interest, and genetic-ecologic protection of resources as well as protection of other forest ecosystems containing natural element of special value s " In this subgroup there were defined new functional categories which were framed in functional types (tables 1 and 2) [3].

By considering the elements presented in the mentioned tables, there results that, by comparison with functional categories from technical norms regarding forest management, there have been included some new categories (1.5.c, 1.5.s, 1.5.t)and some of them have been divided or revised (1.5.f, 1.5.i, 1.5.j). An essential modification is constituted by the inclusion of natural reservations which were constituted until now in 1.5.d category – Forests constituted as scientific reservations, following the interdiction on any unapproved management interventions by the national bodies in the forests declared as natural reservations having strict protection (as those considered until now as belonging to 1.5.c category).

Table 1

Functional framing criteria of the forests included in natural protected areas

Functional category	Framing criteria	Functional categories type
I.5.a	Forests for conservation of genetic resources	II
I.5.b	Forests proposed for temporary protection	II
I.5.c	Forests constituted in natural reservations	I – II
1.5.d	Forests constituted in scientific reservations	I
I.5.e	Forests constituted in natural reservations of special interest	I
I.5.f	Forests for protection of natural monuments	II
I.5.g	Forests for scientific research on determined period	II
I.5.h	Forests constituted as seed reservations	II
I.5.i	Forests/forest ecosystems with protective value for natural habitats and/or species populations of special interest, according to the current legislation	II – IV
I.5.j	Secular and virgin forests	I
I.5.k	Dendrological and arboretum parks	II
I.5.l	Forests included in protection zones of the natural protected areas from natural and national parks as well as other reservations	III
I.5.m	Forests which are bordering strict/integral protection zones from national parks and biosphere reservations	II
I.5.n	Forests belonging to national or natural parks and biosphere reservations, which are included in sustainable development zones (see note)	IV
I.5.o	Nature monuments, constituted from stands/forest ecosystems or trees/tree groups located inside forests	I
I.5.p	Forests/forest ecosystems included in special protection areas for avifauna, in order to conserve the habitats and/or wild migratory bird species mentioned in the legislation	II – IV
I.5.r	Secular quasi-virgin forests with special value structures	II
I.5.s	Other forests presenting environmental and protective values included by the management plan in the strict protection zone	I
I.5.t	Other forests included by management plan in integral protection zone of the protected natural areas	I

Note: in case of forests included in geoparks the functional framing of differentiate regime is maintained by delimitation from other natural protected areas: functional category I.5.s, (TI) is attributed to forests located in strict protection delimited in geoparks; categories I.5.l (TIII) and I.5.m (TII) are attributed to protection forests (buffer zone) of strict protection zones and category I.5.n (TIV) is attributed to forests located in sustainable development zones delimited within geoparks. Also, in case of forests to be included in ecological corridors, the functional categories from I.5 subgroups are destined to lead to the conservation and protection measures which are favorable for carrying out objectives for which the mentioned forests will be assigned.

Table 2

Assignations regarding the functional framing of the forest included in natural protected areas

Functional category	Specifications
I.5.a	Unmodified functional category
I.5.b	Unmodified functional category
I.5.c	New category, including forests which are declared protected areas belonging to d category (according .GEO. no.57/2007, with further modifications approved through law 49/2011: natural reservations (according to IV IUCN category). A management regime corresponding to the 2nd functional type will be applied only in reservations in which, by management plans there are imposed active management measures in order to maintain the habitats and/or in order to protect certain species, species groups or biotic communities
1.5.d	Category content has been modified: along with forests constituted and treated until now as scientific reservations; in this functional category there will be included all the forests which according to anterior regulations belonged to 1.5.c. functional category –forests constituted in natural reservations. This inclusion is justified by the fact that the mentioned reservations are natural strict reservations and they are the equivalent of I IUCN category a – Scientific reservations from .GEO. no.57/2007, with further modifications and completions, approved through law 49/2011. Also, according to the mentioned ordinance, the natural reservations as well as other natural protected areas keep their protection regime until the law coming into force.
I.5.e	Unmodified functional category ;the "special interest" phrase was added in order to underline the importance of social value and the necessity of inclusion in 1st functional type
I.5.f	Unmodified functional category
I.5.g	Unmodified functional category; "with determined period" phrase was added in order to avoid certain confusions with scientific reservations, in which, there are allowed scientific research activities
I.5.h	Unmodified functional category
I.5.i	They are framed in II – IV functional types if, through management plan of the protected area they have been not included in TI. there was considered the necessity of forests identification, included or not included in sites which belong to the European network Nature 2000
I.5.j	New functional category containing only virgin forests from I.5.j. category, (without quasi-virgin forests), in order to include them in 1st functional type. There is considered the tracking of these forests natural evolution, whose surface has been drastically reduced and their disappearing danger exists
I.5.k	Unmodified functional category
I.5.l	Forests from sustainable conservation and sustainable management zones belonging to national and natural parks, not included in I.5.m category, constituting the protection zone (buffer zone) of forest genetic resources or other reservations as well as forests from biosphere reservations included in reconstruction zones which present a management regime according to the 3rd functional type. Reviewed functional category
I.5.m	There are considered forest strips integrating the first row of whole parcels, delimited around the strict and integral protection zones from national parks (according to article 22, paragraph (8), letter j) from the mentioned ordinance) as well as those constituted as buffer zones around the strict protected zones from biosphere reservations (TII)

Functional category	Specifications
I.5.n	Modified functional category
I.5.o	New category, distinct from that of „forests with nature monuments protection". If the value of above mentioned elements impose that they must be declared nature monuments (the case of beech group from Snagov), they must be submitted to integral protection and cannot be included in I.5.f. category where the management interventions are admitted and even indicated (conservation interventions). These nature monuments are included in I.5.f.' o category, corresponding to the 1st functional type, if they have been not previously included in I.5.d. category, as scientific reservations;
I.5.p	They are included in TII – TIV if they have been not previously included in TI. New functional category; there was considered the necessity of forest identification, included or not in sites, which belong to the European network Nature 2000 for their distinct special protection objective of avifauna
I.5.r	New functional category, arising from I.5.j. category and maintained in the 2nd functional type
I.5.s	They are considered strictly protected zones from national and natural parks as well as biosphere reservations. New functional category created according to the new legislation
I.5.t	New functional category created according to the new legislation

For each modification there were presented the necessary justifications (table 2). In order to avoid any confusion the proposals have respected, as much as possible, the symbols of functional categories of current technical norms for forest management. Obviously, if the modifications are approved, they will be introduced in project for technical norms.

4.2 Elements regarding the internal zoning of forests belonging to natural protected areas

According to article 22 of GEO. 57/2007, in national and natural parks there can be constituted in the order of intensity measures of protection, conservation and sustainable development the following internal zones [6]:

A. Zones with strict protection. In this zone there can be included the following functional categories:

1.5.d Forests constituted in scientific reservations (TI);

I.5.o Natural monuments constituted from stands/forest ecosystems or trees/trees groups within forests (TI);

I.5.s Other forests having special environmental and protective values included through the management plan in the strict protection zone (TI).

B. Integral protection zones. In these zones there can be included the following functional categories:

I.5.j Secular and virgin forests (TI);

I.5.t Other forests included by the management plans in the integral protection zone of the natural protected areas (assimilated TI).

C. Zone of other forests included in natural protected areas – other than those from strict and integral protection zones (A and B). These forests are included in the sustainable conservation and sustainable management zones from national and natural parks, in buffer zones from ecological reconstruction zones as well as from sustainable development zones of

these protected areas. Also, they can constitute protection zones (buffer zones) for forest genetic resources or for other reservations.

In natural parks and biosphere reservations zones there can be included the following conventional functional categories:

I.5.a Forests constituted for genetic resources conservation (TII);

I.5.m Forests bordering the strict and/or integral protection zone from national parks and biosphere reservations (TII);

I.5.l Forests included in protection zones of the natural protected areas from natural and national parks and other reservations (TIII);

I.5.n Forests from natural and national parks as well as those from biosphere reservations which are included in sustainable development zones (TIV).

Forests from these conventional/generic functional categories are integrated into the 1st functional group (forests with protection functions) management regime. The total surface of a certain protected area is obtained by adding the surface of the forests from I.5.l and I.5.n functional categories to the surface of forests from A and B zones of the complex protected area where they belong (national park, natural park, etc.).

By including in the majority forests having ecological and social interest, the zones delimited in national parks, natural parks and biosphere reservations can be superposed to any category from the 1st functional group. Functional categories, through the functional type to which they belong , impose a corresponding protection regime for the performance of management objectives which is specific to each zone. This aspect has a high importance due the fact that the identification of the respective functional categories as well as functional types is determined for their inclusion in those zones, in order to choose the protection regime or treatments and other interventions needed to ensure the functionality of stands

4.3 Regulations regarding the mode of protection, conservation and sustainable development of forests included in natural protected areas

Regarding the actions from the strict protection areas (A), as they result from the above, these forests are the object of integral protection regime, according to 1st functional type. In these areas there are allowed only the following activities: scientific research, eco-touristic and ecologic education. No derogations are permitted for natural resources exploitation or other silvicultural interventions, except the localization and operative extinguishment of fires [3].

In forests from the integral protection zone (B) – which are also the object of integral protection regime – the silvicultural interventions can be realized only in order to protect and maintain the natural ecosystems, to prevent and control the effects of certain natural disasters, after the approval of the forestry central public authority and environment central public authority. In forests from this zone there are allowed interventions for rapid localization and extinguishment of the forest fires. Also, with approval from central public authorities there are allowed prevention and control actions regarding the forest pests.

By exception, in forests belonging to this zone, (other than perimeters of scientific reservations), with special approvals there can be performed ecological reconstruction of the stands if they present non-corresponding compositions or structures.

In case of forests included in natural protected areas which are not part of strict

or integral protection zones, the management strategies is established by considering the functional type which corresponds to the main protection function. For each stand there will be established the main function, respectively the function for which there is imposed the most intensive silvicultural system, or the intervention which lesser affects the natural environment and facilitates the carrying out in optimum conditions of the respective function. Thus, if a stand is included in C zone of a natural park, having I.5.n functional category, corresponding to 4th functional type but it is located on a increased slope valley side presenting erosion risk - I.2.a. functional category, corresponding to 2nd functional type, the last one will be considered for choices of silvicultural measures (conservation interventions).

Forests corresponding to the 2nd functional type are the object of special conservation regime. For these forests production is not established, and the management interventions present a conservation character of ecological and social protection. A management regime corresponding to the 2nd type is also, applied to forest strips delimited as the first row of parcels which are bordering strict and integral protection zones from natural and national parks, as well as to buffer zones from biosphere reservations, genetic resources and other forests included in categories from the 2nd functional type.

In forests corresponding to 3rd and 4th functional types belonging to natural protected areas there will be applied silvicultural systems presenting increased intensity grades which promote natural regeneration of the stands. The choice of silvicultural systems will be performed according to annex 3 from forest management norms [8], by considering the following supplementary assignments:

- In forests from national parks, included in sustainable conservation zones, there can be applied selective systems and/or transformation or selective systems, quasi selective systems and group shelterwood systems with long regeneration period;
- In forests from natural parks, included in sustainable management zones as well as in those from biosphere reservations there can be applied selective systems and/or transformation or selective systems, quasi selective systems, group shelterwood systems with long regeneration period and coppice in black locust, poplar and willow stands; in case of well justified cases, there can be applied classical group and uniform shelterwood systems as well as their marginal shelter variant.

In the application of the mentioned systems there must be considered the maintenance or creation of polyvalent structures, closer as much as possible to the specific structures of natural ecosystem by keeping in mind the particularities imposed by the necessity of carrying out the main functions [5]. In all cases, through applied measures special attention will be paid to maintenance and amelioration of environmental conditions by respecting strictly the interventions limits imposed by the management plan regarding the application of harvesting/regeneration technologies which must assure seed, stand, water and soil protection (chemicals are forbidden).

5. Conclusions

In the process of defining the functional criteria, there was considered the internal zoning of the national and natural parks as well as of the biosphere reservations according to updated GEO. 57/2007 regulations.

The new proposed functional zoning criteria offer the tools for adequate functional framing of the forests belonging to the natural protected areas in order to apply differentiated management strategies according to objectives for which the mentioned areas were designated.

Specification of the type that fits each functional category is likely to lead to the establishment of management measures to be applied, referring mainly to the application of treatment.

References

1. Carcea F. et al., 2005. Forest Functions and Management Bases. (in Romanian). Romanian Academy Press, Bucharest.
2. Carcea F. et al., 2006. Draft 3. Proposals for Supplementary Regulations Regarding the Management of Forests Included in Natural Protected Areas (in Romanian). R.N.P., Bucharest.
3. Carcea F. et al., 2012. New Aspects Regarding Management of the Forests Included in Natural Protected Areas (in Romanian). Transilvania University Press, Braşov.
4. Leahu I., 2001. Forest Management (in Romanian). Editura Didactică şi Pedagogică, R. A., Bucureşti.
5. Rucăreanu N., Leahu I., 1982. Forest Management (in Romanian). Ceres Publishing House, Bucharest.
6. *** O.U.G. no. 57/2007 regarding the natural protected areas regime, published in M.O. no. 262/2011
7. *** M.A.P.P.M, 2000. Technical Norms for Forest Management, Bucharest.
8. *** M.A.P.P.M., 2000. Technical Norms for Choice and Application of Silvicultural Systems, Bucharest.